AUGUST 8, 1931

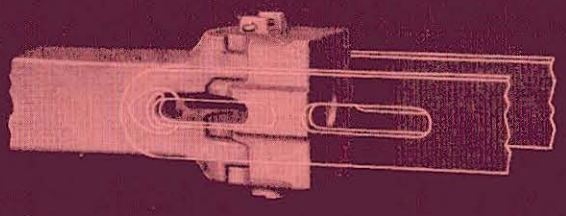
Railway Age

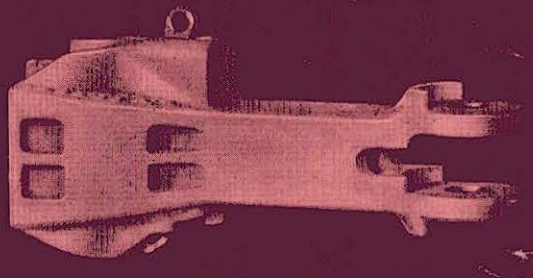
Founded In 1856

GENEVA COLLEGE LIBRARY

THE
SWIVEL BUTT
COUPLER

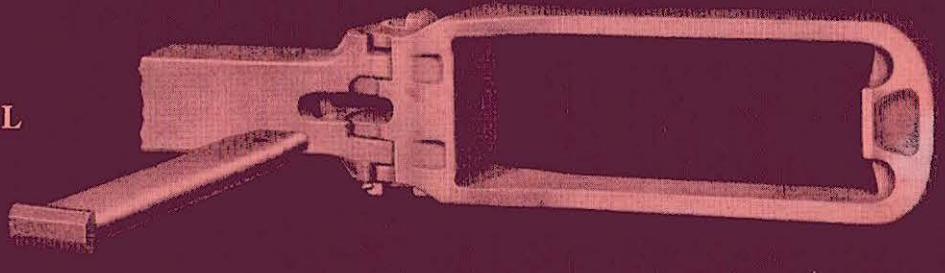
FOR
HORIZONTAL
YOKE





THE
SWIVEL
SHANK

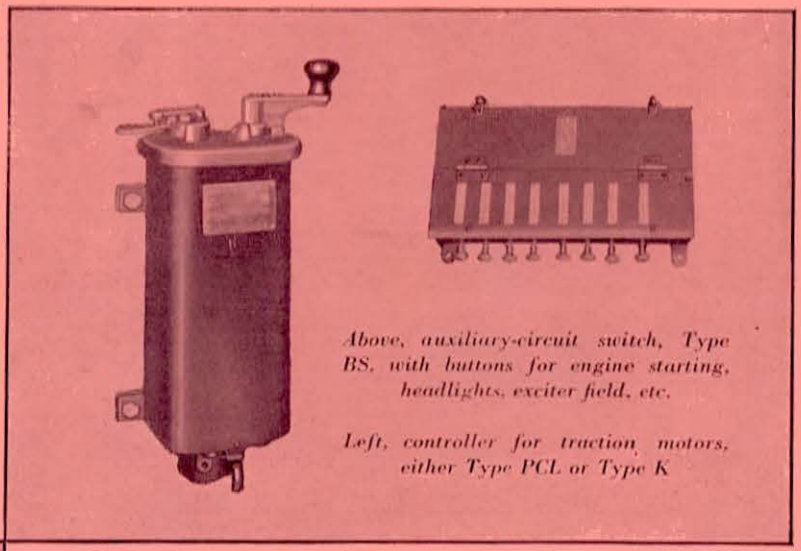
WITH
VERTICAL
YOKE



SWIVEL SHANK, BUTT AND YOKE CAN BE PURCHASED
FROM ANY COUPLER MANUFACTURER

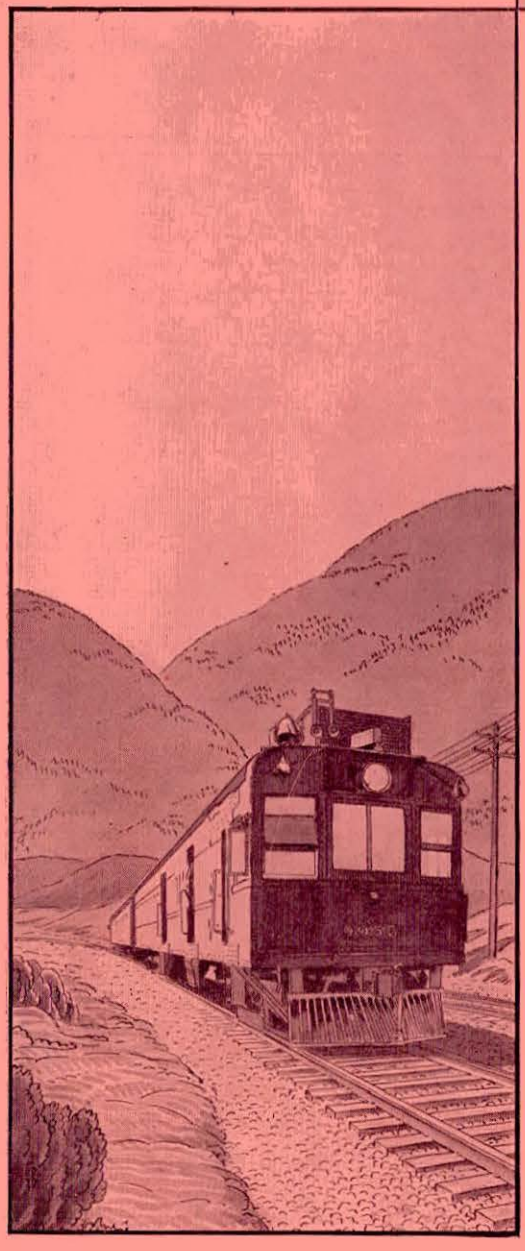
THE SYMINGTON CO.

Gas-electric Rail-car Control



Above, auxiliary-circuit switch, Type BS, with buttons for engine starting, headlights, exciter field, etc.

Left, controller for traction motors, either Type PCL or Type K



Part of a Complete G-E Equipment

G-E control for rail cars includes the switches, contactors, and cable necessary to control and regulate the electric power transmitted from the generator to the traction motors. To meet every requirement of maintenance and operation, two kinds of control are available—direct and remote. And like all other parts of G-E rail-car equipment, G-E control has proved its value in the service of railroads throughout the United States and in foreign countries. That is why a large majority of the gas-electric rail-cars in service are G-E equipped. General Electric Company, Schenectady, N. Y.

Join us in the General Electric program, broadcast every Saturday evening on a nation-wide N.B.C. network

391-46

GENERAL ELECTRIC

RAILROAD EQUIPMENT

Alphabetical Index to Advertisers—Page 48 Buyers Directory of Advertisers—Page 41

Published weekly by Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa. Entered as second class matter, March 9, 1928, at the Post Office at East Stroudsburg, Pa., under the act of March 3, 1879.
Address communications to 30 Church St., New York City.

MINER

Class A-22-XB
Friction Draft Gear

Exceeds the A. R. A. Requirements for Certified Draft Gears

W. H. MINER, INC.
CHICAGO

Modern Power Increases Ton Mileage per Train-Hour

2-10-2 TYPE LOCOMOTIVE
CLASS K-1-SB
Built for the
READING COMPANY

Cylinders	30½" x 32"
Drivers, diameter	61½"
Steam pressure	225 lb.
Grate area	108 sq. ft.
Water heating surface	5472 sq. ft.
Superheating surface	1578 sq. ft.
Weight on drivers	363,900 lb.
Weight, total engine	451,000 lb.
Tractive force	92,500 lb.

THE READING, during recent years, has made a most successful effort to increase the gross ton-miles per train-hour. On the Harrisburg Division, which handles approximately 30 per cent of the traffic of the entire System, this ton-mileage averaged 29,000 in 1927; while during the last six months of 1930, the average was 36,317—an increase of 25 per cent.

Ten new locomotives of the 2-10-2 type, built at our Works, are doing their share in still further increasing the efficiency of operation.

These locomotives were built to drawings and specifications prepared by the Reading Company, and are specially fitted to handle the heavy tonnage of coal and merchandise freight that moves over the lines of this important System.

THE BALDWIN LOCOMOTIVE WORKS ★ 1831 1931

THE
BALDWIN
LOCOMOTIVE WORKS
PHILADELPHIA

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York Office 30 Church Street

EDWARD A. SIMMONS, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
HENRY LEE, *Vice-Pres.*
SAMUEL O. DUNN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
FREDERICK H. THOMPSON, *Vice-Pres.*
ROY V. WRIGHT, *Sec'y.*
JOHN T. DEMOTT, *Treas.*

CHICAGO
105 West Adams St.

WASHINGTON
17th and H. Streets, N. W.

CLEVELAND
Terminal Tower

SAN FRANCISCO
215 Market St.

Editorial Staff

SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. A. DOSTER
JOHN C. EMERY
MARION B. RICHARDSON
H. C. WILCOX
NEAL D. HOWARD
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
GARDNER C. HUDSON
M. H. DICK

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office

Vol. 91 August 8, 1931 No. 6

In This Issue

Centralized Machine Accounting for Better Records, Lower Costs ..... Page 199

Article No. 5 of the Operating Economy Series, in which J. C. Wallace, general auditor, Cleveland, Cincinnati, Chicago & St. Louis, tells how centralizing makes profitable employment of machine methods possible.

Pennsylvania Adopts 152-lb. Rail 205

T. J. Skilliman, chief engineer of this road, describes how demand for greater stiffness and longer life under increasing axle loads and higher speeds are met by the design of this heavy section.

Increasing L.C.L. Freight Traffic 207

George A. Powell, trans-ship clerk of the Canadian Pacific at Smith's Falls, Ont., finds that competition must be met by pick-up and delivery service, advertising, overnight deliveries and faster schedules.

EDITORIALS

On "Meeting Competition" 195
How Secure Economies in Accounting Work? 197
The Locomotive As An Advertising Medium 197
To Our Canadian Readers 198

GENERAL ARTICLES

Centralized Machine Accounting for Better Records, Lower Costs, by J. C. Wallace 199
Freight Car Loading 201
Railroad Labor Leaders Protest Wage Discussion 202
Reading Builds 20 Steel Cabooses 203
Pennsylvania Adopts 152-lb. Rail, by T. J. Skilliman 205
Reading's Testimony on Traffic and Purchases 206
Increasing L.C.L. Freight Traffic, by George A. Powell 207
Slightly Less Wood Treatment in 1930 210
Revenue Hopper Cars Made Equally Adapted for Ballast Work 211
New England Distrustful of Percentage Rate Rise 212

BOOKS AND LETTERS 214

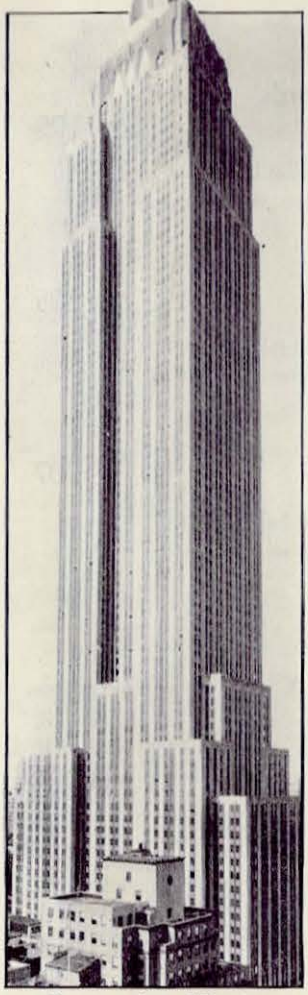
ODDS AND ENDS 215

NEWS 216

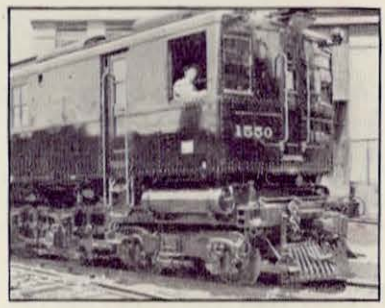
The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Gargoyle Lubricants *chosen for* Today's "Biggests"

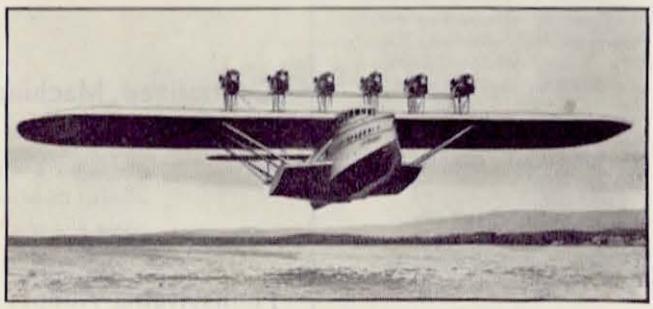
The Hudson River Bridge—World's longest-span suspension bridge—all construction machinery correctly lubricated



Construction of Empire State Building—World's tallest building



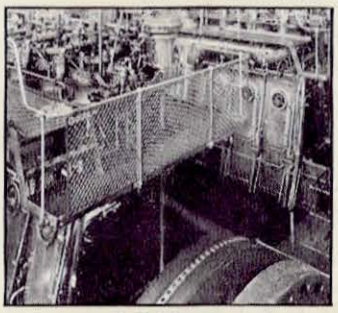
N. Y. Central Diesel-electric—one of the world's largest group of Diesel-electric locomotives



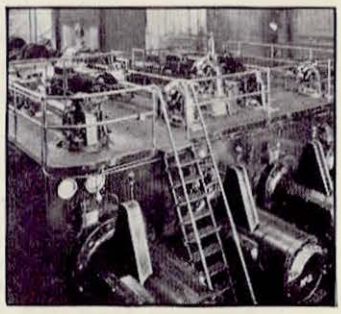
The Dornier Do-X—World's largest monoplane

Merchant's Refrigerating Co.—World's largest cold storage plant

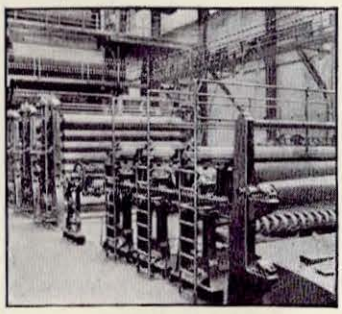
Largest American Coal Breaker at Lansford, Pa.



Freeport N.Y. Municipal Power Station—Largest U. S. municipal Diesel Station



25,000-h.p. Nordberg—World's largest uniflow engine



World's largest paper-board machine

S.S. Leviathan—World's largest liner

GARGOYLE

Lubricants

VACUUM OIL COMPANY

WHERE RED SIGNALS SAFETY . . .

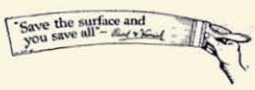
JUST as the coastwise skipper breathes more easily when he "picks up" the oscillations of a charted beacon, so does the maintenance man feel more secure when he sees that his iron and steel structures have their protective coatings of pure red-lead.

For engineers and maintenance men in all fields have learned that pure red-lead defeats the destructive forces that bear the names of weather, corrosion, rust.

Dutch Boy Red-Lead is a fine, uniform, highly oxidized pigment that furnishes an elastic, durable coating that sticks tight—that protects completely—that wears long.

You can buy Dutch Boy Red-Lead in either paste or liquid form. The paste—Red-Lead-in-oil—is easily thinned to brushing consistency. It comes in the natural orange-red and it can be shaded to darker colors. Dutch Boy Liquid Red-Lead is supplied in six colors—orange-red, two shades each of green and brown...and black.

We invite you to consult our Department of Technical Paint Service about your metal painting problems. Also, ask our nearest branch for helpful booklet—"Structural Metal Painting".



DUTCH BOY RED-LEAD

NATIONAL LEAD COMPANY

New York, 111 Broadway—Buffalo, 116 Oak St.—Chicago, 900 W. 18th St.—Cincinnati, 659 Freeman Ave.—Cleveland, 820 West Superior Ave.—St. Louis, 722 Chestnut Street—San Francisco, 2240 24th Street—Boston, National-Boston Lead Company, 800 Albany Street—Pittsburgh, National Lead & Oil Company of Pa., 316 Fourth Avenue—Philadelphia, John T. Lewis & Bros. Co., Widener Building.

One Man in Forty—
and YOU *are the Man*

DID you ever stop to think that *you* are one of the comparatively small percentage of men whose "yes" or "no" really matters to American business?

Every morning 40,000,000 men start to work—in factories and mines, banks, railways, stores and other centers of industry or trade. Forty million men turn the wheels that keep America clothed, sheltered and fed.

But only one million of them make business decisions. Only one man in forty has the ability, the responsibility or the authority to say yes or no in business matters. Hence the *real* managing power of the country lies in the hands of these million men—less than one per cent of its total population.

As a member of this group—this controlling minority—you share an important responsibility—the triple responsibility of wisely liberal purchasing, of generous employment and of sane management to hasten the return of general prosperity.

• • •

How, you ask, do we know that *you* are one of the million who make decisions for others to follow? Because men who read business papers are alert and eager for news of new plans, new methods, new equipment. That is *why* they are the men who control affairs.

ABP

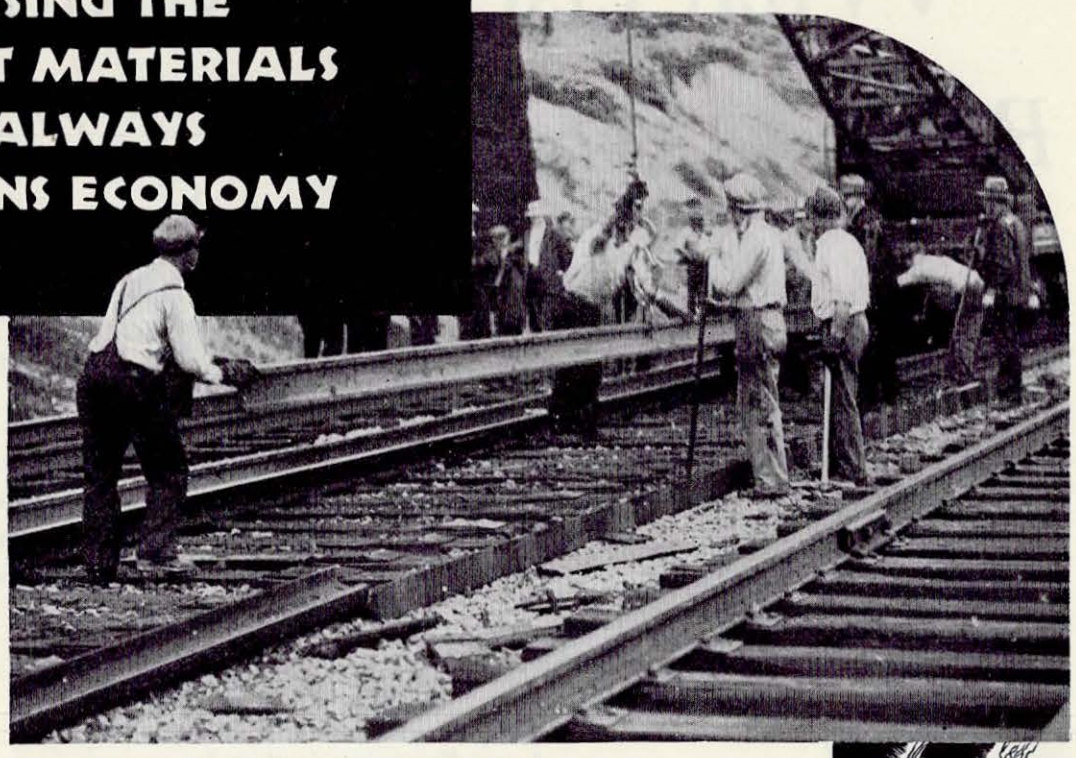
THIS SYMBOL *identifies an ABP paper . . . It stands for honest, known, paid circulation; straightforward business methods, and editorial standards that insure reader interest . . . These are the factors that make a valuable advertising medium.*

RAILWAY AGE IS A MEMBER OF

THE ASSOCIATED BUSINESS PAPERS, INC.

TWO-NINETY-FIVE MADISON AVENUE - NEW YORK CITY

USING THE RIGHT MATERIALS ALWAYS MEANS ECONOMY



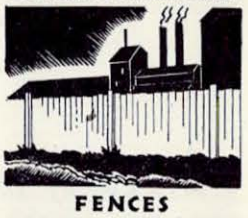
152-pound rails are being adopted as standard on the main lines of the Pennsylvania Railroad, replacing the old 130-pound rails. This photograph, taken a few miles east of Pittsburgh, shows the first of these 152-pound rails being laid on Century Creosoted Oak Ties.

When the Pennsylvania Railroad decided to install 152-pound rails a careful inspection of the Century Creosoted Ties indicated that it would not be necessary to install new ties. In fact, many of the old ties will still be capable of rendering service after the new heavy steel rails have been replaced—for the Century Creosoted Ties in the track illustrated will average 27 years of service.

Rarely is any material subjected to so grueling a test as are these Century Creosoted Ties. In their 27 years of service, they are exposed to all kinds of weather, blistering sun, beating rains and snow, withstanding the weight and sudden shock delivered year after year, as the pounding wheels of the Broadway Limited and the great fleet of other passenger and freight trains of the Pennsylvania speed, with safety and comfort, on to their destination—but try as they may these battering rams of time, strain, weight and sudden shock spend themselves harmlessly against resilient, shock-absorbing, long-lasting Century Treated Ties. Certainly here is the right material.

The economy of Century Preserved Forest Products demands careful consideration in every use where hard, long-time service is required.

LOADING PLATFORMS



FENCES

STORAGE BINS

FLOORS

ROOF CONSTRUCTION

CENTURY

CENTURY WOOD PRESERVING CO.

DIVISION OF THE WOOD PRESERVING CORPORATION

KOPPERS BUILDING » PITTSBURGH, PA.

SALES OFFICES—Baltimore » Boston » Charleston, S. C. » New York » Philadelphia » Pittsburgh Reed City, Mich. TREATING PLANTS—Adelaide, Pa. » Charleston, S. C. » Hagerstown, Md. Nashua, N. H. » Newport, Del. » Orrville, O. » Reed City, Mich.

"What else can we do to *Reduce Accounting Costs?*"

Perhaps you are still asking this question despite the fact that you have materially cut accounting costs. It may seem as if no further economies in this direction are possible, yet there is another factor worthy of your consideration.

We suggest that you study, as never before, the new developments that have taken place in the business machine equipment field . . . developments that not only effect decided economies, but also provide greater speed, ease of operation and accuracy in the handling of all kinds of records.

Outstanding among these new developments are, for example, the following for freight accounting work:

A new Burroughs machine for preparing agents' abstracts and station register in one operation—

A new Burroughs tabulating and statistical machine for compiling freight statistics and auditing agents' accounts—

A new Burroughs for writing abstracts and division sheets of inter-line waybills—

A new Burroughs for establishing inter-line road control figures.

There have also been recent improvements in other Burroughs machines, providing new possibilities of further economies on many routine adding, bookkeeping and calculating jobs in railway accounting.

Many roads find that these new machines not only materially reduce the cost of accounting, but also that purchasing these machines outright enables a road to transfer this lesser charge from operating expense to capital expenditure.

Investigate. The experience and facilities of the Burroughs Railroad Accounting Division are at your command. Call the local Burroughs office, or write direct to Burroughs Railroad Accounting Division in Detroit.

A Few of the Newer Developments in Machines for Railroad Accounting

BURROUGHS STATION ABSTRACT AND REGISTER MACHINE

BURROUGHS COMMODITY STATISTICS MACHINE

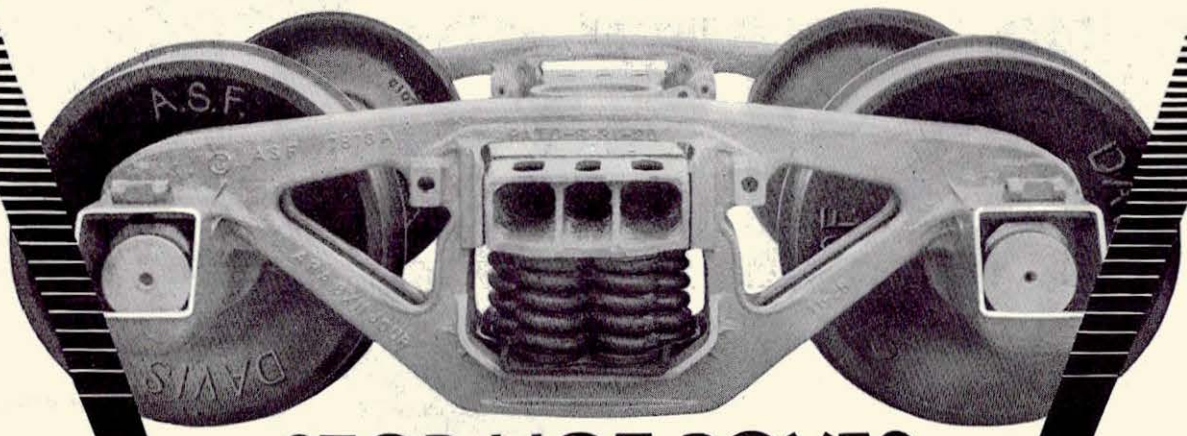
BURROUGHS TYPEWRITER ABSTRACT MACHINE

BURROUGHS ROAD CONTROL MACHINE

BURROUGHS ADDING MACHINE COMPANY, DETROIT, MICH.
(*Railroad Accounting Division*)

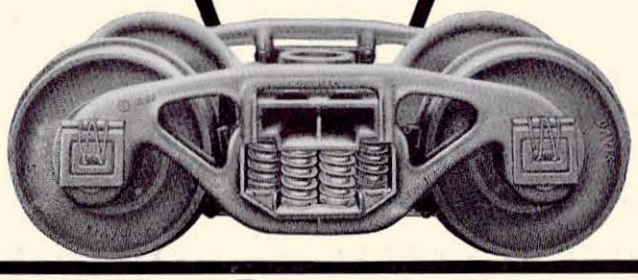
Burroughs

Maintain the Oil Film



STOP HOT BOXES

THE additional spring capacity of the Dalman Truck protects not only equipment, lading and road-bed from destructive shocks but also the journal itself. The uncushioned blows caused by either overloading or failure of springs breaks down the film of oil and causes hot boxes. The Dalman Truck provides the spring capacity to cushion these blows, so that the film of oil is maintained, materially reducing bearing trouble.



AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

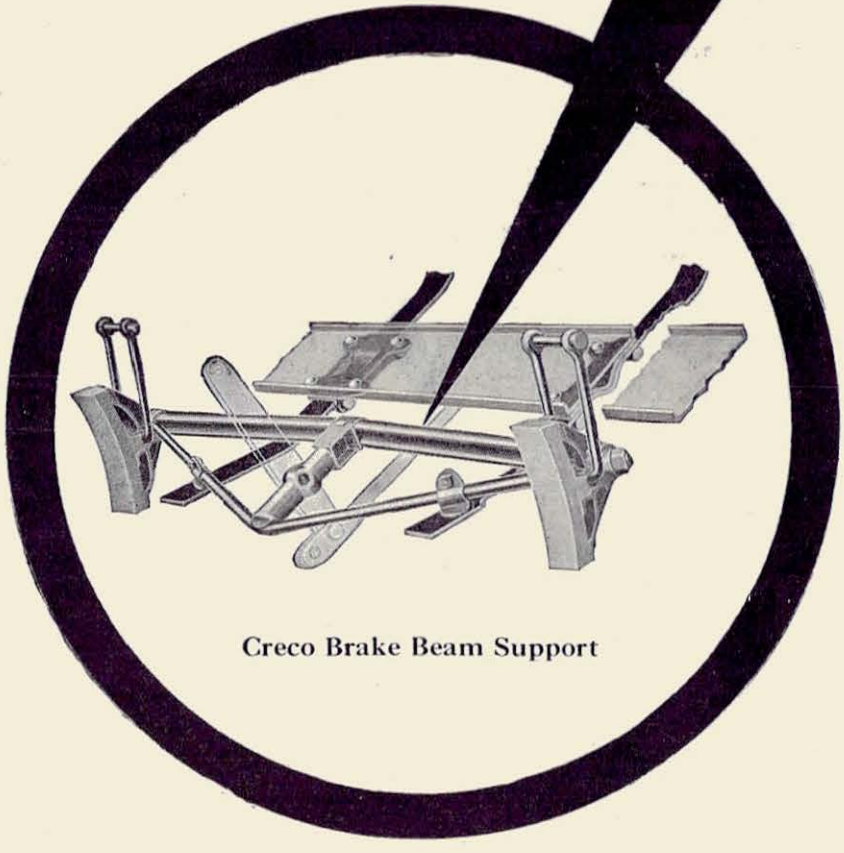
PROTECTION

against derailment

against vibration

against torsional stress

against dragging brake shoes



Creco Brake Beam Support

CHICAGO RAILWAY EQUIPMENT CO.
CHICAGO

ARMCO

LOCOMOTIVE JACKET SHEETS will help you CONTROL MAINTENANCE

YOU can depend on Armco locomotive jacket sheets to help you keep maintenance expenditures within proper bounds—from the time they are put on in the shops until the last mile of service has been rendered.

Savings begin with forming and application. Armco locomotive jacket sheets are dense and ductile, with a specially processed surface that preserves its smooth texture through far more shoppings than ordinary sheets.

There are several different grades and finishes: one for every purpose. Some are carried in stock, ready for immediate shipment. When you need locomotive jacket sheets, get in touch with the nearest office. They will be glad to serve you.

RAILROAD PRODUCTS

MADE BY CONTINUOUS PROCESS

Special Car Siding Sheets
Locomotive Jacket Sheets
Freight Car Sheets and Plates
Passenger Car Sheets and Plates
Galvanized Ingot Iron and Steel Sheets
Hot Rolled Ingot Iron and Steel Sheets

•

Wrought Steel Wheels

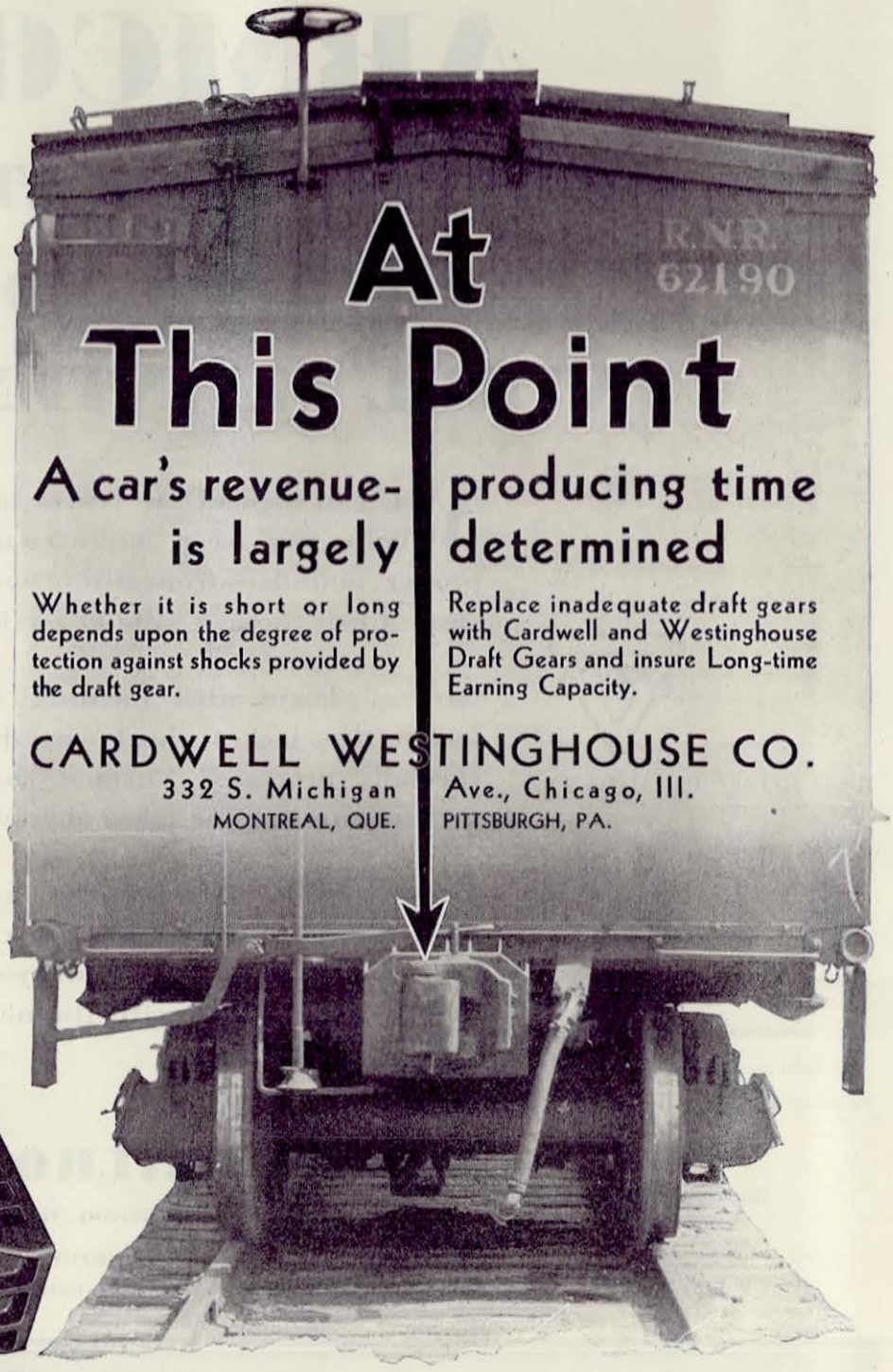
ARMCO RAILROAD SALES CO.

Executive Offices: MIDDLETOWN, OHIO

DISTRICT OFFICES:

Chicago . New York . Philadelphia . Cleveland . St. Louis

ARMCO
IRON AND STEEL
SHEETS FOR EXACTING RAILROAD USES PLATES



At This Point

A car's revenue-producing time is largely determined

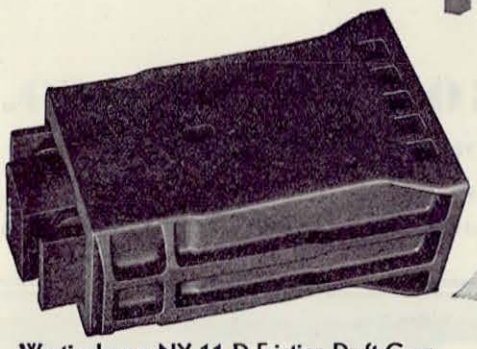
Whether it is short or long depends upon the degree of protection against shocks provided by the draft gear.

Replace inadequate draft gears with Cardwell and Westinghouse Draft Gears and insure Long-time Earning Capacity.

CARDWELL WESTINGHOUSE CO.
332 S. Michigan Ave., Chicago, Ill.
MONTREAL, QUE. PITTSBURGH, PA.

CARDWELL WESTINGHOUSE DRAFT GEARS

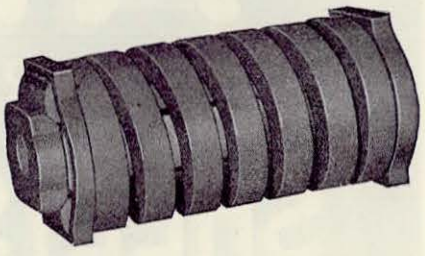
Made in types and designs to fit any kind of car construction or draft gear attachments on new or old equipment, and in sizes and capacities which meet all modern and A. R. A. requirements. » » » »



Westinghouse NY-11-D Friction Draft Gear

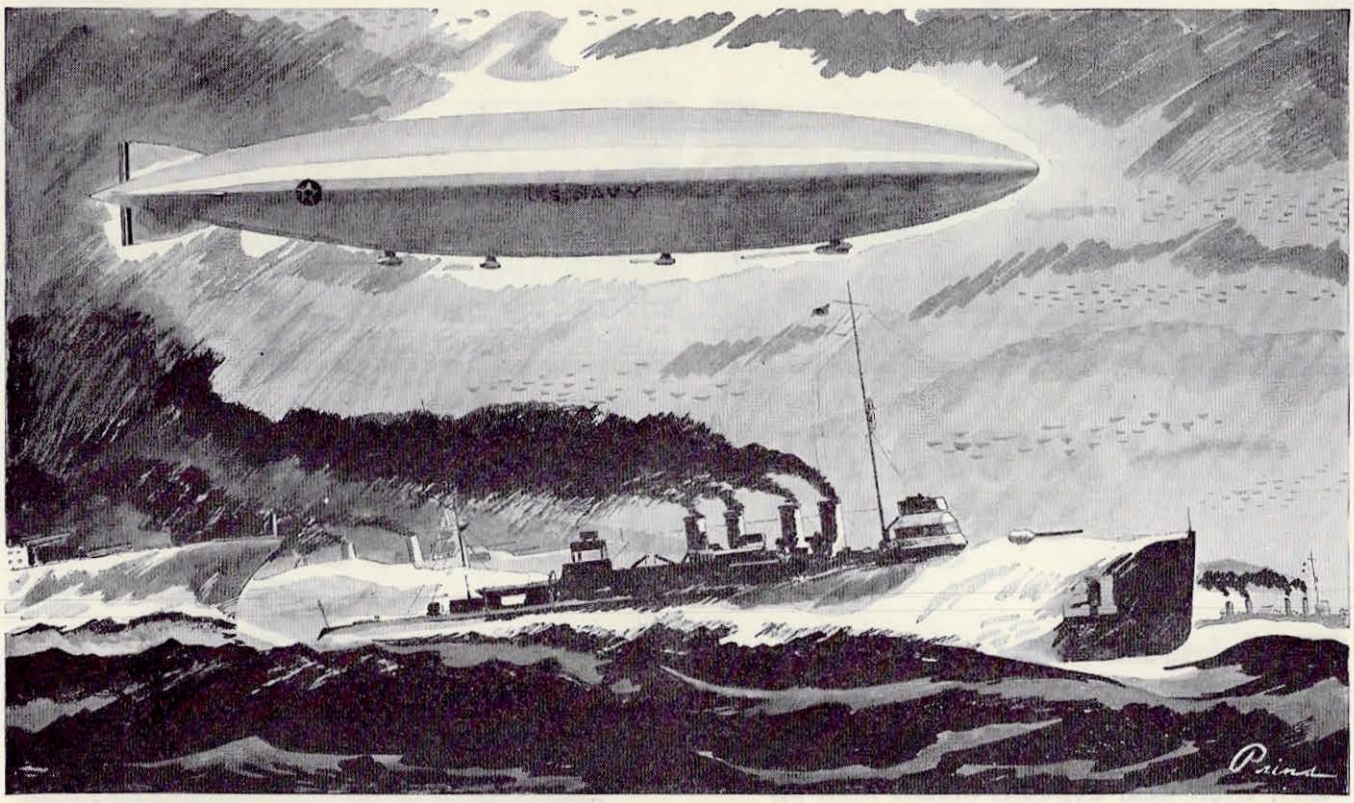
Cardwell L-25 Friction Draft Gear

Cardwell Westinghouse Friction Draft Gear Type F-2



GOOD DRAFT GEARS MAKE CARS GO FARTHER

TAKE A HINT FROM THE NAVY



PERHAPS you have already combed your business from top to bottom . . . reducing expenses wherever possible without impeding efficiency. But are you sure that you have caught *every hidden saving?*

What about transportation? Many manufacturers, after having trimmed costs in every way they thought possible, found additional economies by shipping in bulk.

The United States Navy, for example, cut 85% from its cost of transporting helium. This gas, which is used in all Navy dirigibles is now carried in specially designed tank cars. Here is but one of the many instances where bulk shipment has proven more economical than the former method of shipping in small containers.

General American can build railroad freight cars to carry *anything* in bulk. In addition to this, General American leases to shippers a fleet of 50,000 cars in which you may find just the type of car you need.

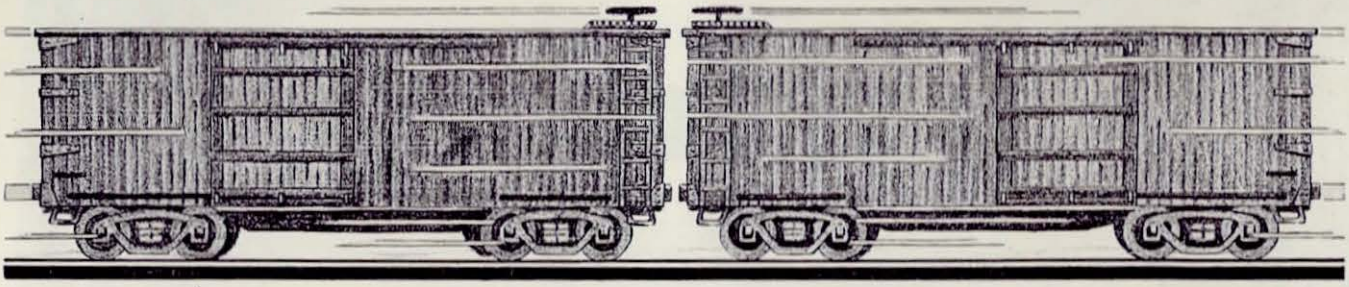
If your shipping problem is particularly difficult, and there are no cars in our fleet for you to use, we will build a car exactly suited to your requirements. We have never been asked to build a car which we did not successfully construct and feel quite sure that we will not fail to build yours.

The more difficult your problem, the more anxious we are to work with you. Our engineers will welcome the opportunity to talk things over...without any obligation on your part. Unless you are now shipping in bulk you probably can greatly reduce your distribution costs by so doing. *Address Continental Illinois Bank Bldg., Chicago.*

GENERAL AMERICAN TANK CAR CORPORATION

"A RAILROAD FREIGHT CAR FOR EVERY NEED"

CAPACITY



Arresting the forces of destruction!

THE destructive forces of impact must be arrested by gears of high capacity. Low draft gear capacity means high upkeep costs for cars and undue claims for injury to lading.

The Edgewater Ring Spring Draft Gear arrests the forces of destruction by providing greater capacity than is obtainable with any other gear which fits the standard A. R. A. pocket.

EDGEWATER RING SPRING DRAFT GEAR

Greater capacity than is obtainable with any other gear which fits the standard A. R. A. pocket.

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.

NEW YORK	CHICAGO	BOSTON
WASHINGTON	SEATTLE	ST. LOUIS
PHILADELPHIA	LOUISVILLE	ST. PAUL
BALTIMORE	KANSAS CITY	ATLANTA
	SAN FRANCISCO	

A Locomotive Is No Better Than Its Bearings

YEARS ago the railroads learned to respect the stamina of SKF Journal Bearings. A stamina that has its foundation in the SKF principles of self-alignment and ample bearing capacity distributed over two rows of rollers.

So when long runs and higher speeds accentuated locomotive bearing difficulties the railroads turned to SKF for better truck bearings.

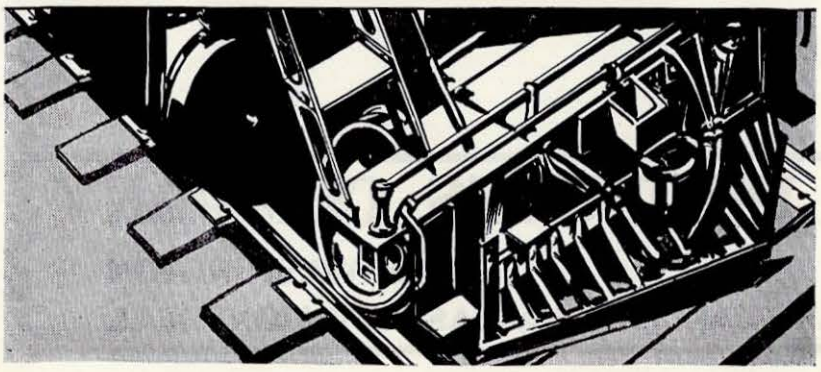
And when increased tender loads brought acute bearing troubles, SKF was chosen to restore dependability.

To tie up a modern locomotive may disrupt train movement over a whole division. Bearings must be thoroughly trustworthy.

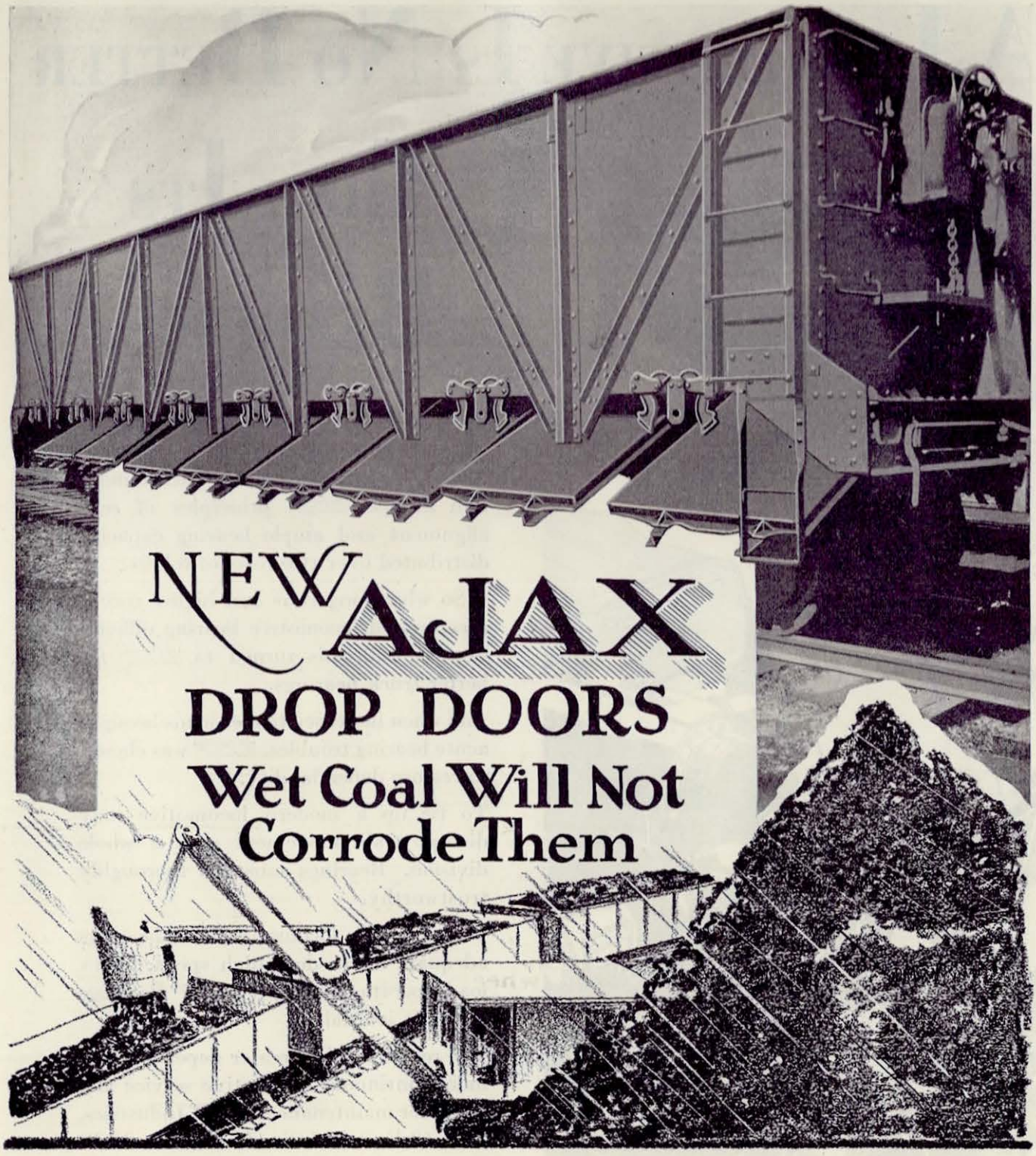
Fit your new locomotive with bearings adequate for modern high speed, heavy load operations. Apply SKF Bearings to every journal.

The result will be greater dependability, more continuous locomotive service and far lower maintenance. SKF Industries, Inc., 40 East 34th St., New York, N. Y.

2750



SKF
JOURNAL
BEARINGS



UNION METAL PRODUCTS COMPANY

NEW YORK · CHICAGO · ST. LOUIS · WASHINGTON
RICHMOND · HOUSTON · SAN FRANCISCO · KANSAS CITY · MONTREAL

"STANDARD 'QT'" WHEELS

OVER 2,000,000,000 WHEEL-MILES **have demonstrated the super-service of "Standard 'Q T'" steel wheels. Under the heaviest loads and most severe conditions of service these wheels have shown greatly superior structural strength and wear life.**

Scientific heat treatment, which produces high physical properties and refinement of structure, is responsible for the super-service of "Q T" wheels. These wheels are uniformly Oil Quenched *throughout* and Tempered to relieve *all* internal strains.

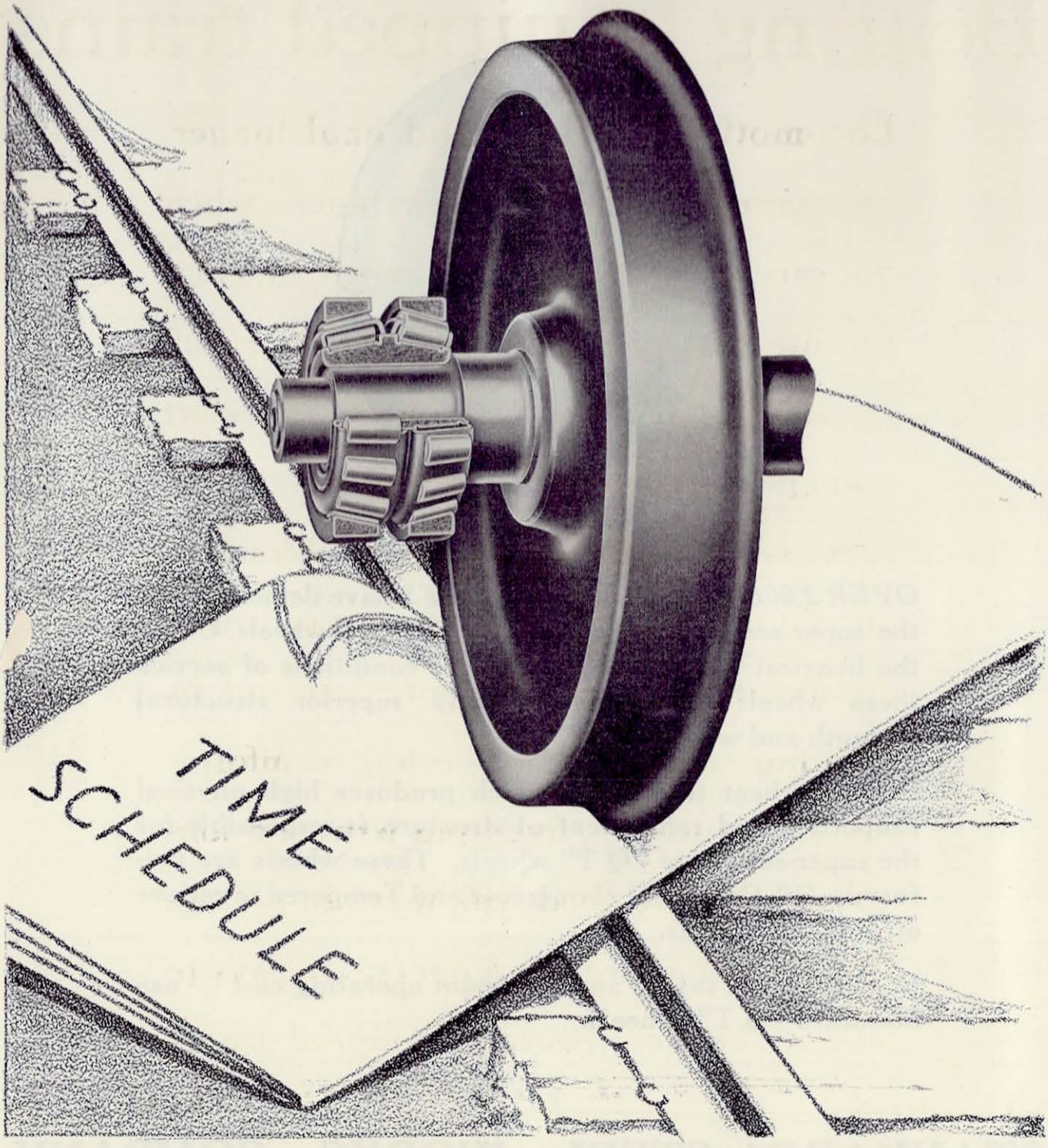
For maximum safety and minimum operating cost — use Standard "Q T" Wheels.

STANDARD STEEL WORKS COMPANY

GENERAL OFFICES & WORKS: BURNHAM, PA.

NEW YORK PHILADELPHIA CHICAGO ST. LOUIS PORTLAND SAN FRANCISCO AKRON

Cut your time schedules



TIMKEN *Tapered Roller*

and costs *with* Timken Bearing Equipped trains

Locomotives can start and haul longer, heavier trains—and haul them faster—when the cars are mounted on Timken Bearings because journal friction is virtually eliminated . . . This means that you can transport more people a given distance in less time at lower cost per person . . . Trains mounted on Timkens are not only faster, more dependable and more economical, but by affording much greater riding comfort—smoother running, free from jerks and jolts—they promote good will, increase prestige and attract more passengers. It pays to operate Timken Bearing Equipped trains.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

BEARINGS

Less Than One Cent

per roof per year for maintenance

THE cost of roof maintenance, from 1913 to 1930 inclusive, on 30,000 Canadian National cars equipped with Dry Lading Roofs, amounted to $4,519.49.

The average maintenance cost per roof, per year, during this 18 year period, amounted to less than one cent.

This remarkable record is indicative of efficient management and a deserved reward of far-sighted vision.

It expresses the value of Dry Lading Roofs in terms of long trouble-free service and dollars and cents savings.

It proves that there is a vast difference between the mere purchase of roofs and really investing in a long term weather-proof roof service.

It proves that low price does not mean low cost but long service does. It's the cost per year that counts.

You cannot get around years of actual records. The Universal Dry Lading Roof is the greatest economical improvement in car construction.

Hutchins Car Roofing Company

RAILWAY AGE

On "Meeting Competition"

One of the policies the railways are frequently urged to adopt for the solution of their problem of getting adequate revenues is that of "meeting competition." This is what concerns of other kinds have to do, some persons say. The railways, they assert, were so long immune from competition that, now that they are confronted with it on every hand, they complain about it, try to evade it, and ask for higher rates, instead of squarely meeting it by reducing their expenses and rates and adopting other policies followed by concerns in other fields in similar circumstances.

The trouble with such statements is that they are not true as to the attitude and policies of concerns and persons engaged in other lines of business, and that they ignore the government policies by which the railways are handicapped in trying to meet competition and by which other concerns are not handicapped.

Buncombe Regarding Competition in Other Industries

Corporations and persons engaged in other lines of business do not assume the uncomplaining and courageous attitude toward competition that these statements imply. There is complaint throughout the country because the interpretation and attempted enforcement of the Sherman anti-trust law interfere with limitation of production and price fixing, and constant and often successful efforts are made to prevent the competition it is intended to cause. Legislation to handicap chain stores in their competition with other retail stores is sought. To excessive competition in production and marketing the prolonged depression in agriculture is largely attributed, and the government, by promoting and subsidizing cooperative marketing under the Farm Relief act, and urging farmers to curtail production, is trying to restrict competition. Many manufacturers, for the purpose of restricting retail competition, dictate the prices at which their products shall be sold to the public. In many branches of commerce and industry prices are largely fixed by agreements existing between manufacturers, jobbers, or retailers.

The indisputable fact is that unrestricted competition is decried by leaders in almost every line of business, and that, when the Sherman law or economic conditions make avoidance of it impossible, to its effects are largely attributed business losses and depression. All the talk to the effect that the railways should meet competition uncomplainingly and courageously as it is met in other branches of industry and commerce is buncombe.

Furthermore, competition in most other industries and the competition to which the railways are subject differ in essential respects. Competition in almost all other industries, in spite of the complaints about it and the efforts to restrict it, is at least competition of private capital with private capital. Those who are managing concerns in most other branches of industry and commerce do not have competition with them promoted by the government with the use of the taxpayers' money, and they are not hindered by the government in meeting it. Concerns and individuals engaged in the marketing of farm products recently have been subjected to government-subsidized competition, and the vigor with which they have denounced it has indicated how other business men would like similar competition.

Competition to Which Railways Are Subject

Steamships transport freight between the Atlantic and Pacific seaboards through the government owned and operated Panama canal, charging rates which are not subjected to regulation. The railways could meet this competition by reducing their rates to the Pacific coast, but could not afford to reduce also all their rates to intermediate points. The Interstate Commerce Commission—that is, the government—forbids them to make lower rates to points where they meet this water competition than they make to intermediate points. Just how do those who urge the railways to "meet competition" suggest that they should meet it in these circumstances, which are created by government policies?

The railways must pay all their costs out of their own earnings. Carriers on inland waterways make lower rates than the railways partly because one-half or more of the cost of inland water transportation is borne by the taxpayers, and partly because it is the

policy of the government to establish rates for its barge line in the Mississippi valley at a level 20 per cent or more below railway rates, regardless of the losses incurred by the barge line. Also, the railways are prohibited by law from operating boats on inland waterways. How would those who urge the railways to "meet competition" suggest that they meet this kind of competition?

Highway transportation both supplements and competes with rail transportation. Regardless of whether buses and trucks render supplementary or competitive service, or are owned by railroads or other companies, they should be required to pay enough for the use of the highways entirely to reimburse the public for all the highway damages and costs that they cause. It is as economically unsound for the general public or private motorists to be taxed to help provide highway transportation conducted for private profit as it would be for them to be taxed to help pay the costs of carrying on any other private business. Motor transportation is supplementary to rail transportation when used to handle traffic the comparatively short distances that it can be handled better and at as low or a lower total cost by highway as by rail. It is competitive with rail transportation when used to handle for long distances traffic which could be handled satisfactorily by rail and at a lower total cost.

Meeting Highway Competition

Buses and trucks, especially the latter, are effectively competing with the railways by handling much traffic which the railways could handle as well or better at a lower total cost. The reason is that, regardless of all claims to the contrary, it is demonstrable that most buses and trucks are able to make their present rates because their operators do not pay adequately for the use of the highways and are therefore subsidized, and, in addition, do not have applied to their rates and service regulation comparable to that applied to those of the railways. How can the railways meet such competition? First, they must get the state and national governments to quit subsidizing their competitors or to begin subsidizing them. They already have asked the governments to quit subsidizing their competitors. Second, they must get the governments either to increase the regulation applied to their competitors or to reduce the regulation applied to themselves, and already they have asked for "comparable" regulation of all carriers. What more can they do? They cannot themselves remedy the disparity due to government subsidizing of their competitors; and as long as government regulation is what it is they can not, without government consent, so adjust rates downward on competitive traffic and upward on non-competitive traffic as to get the maximum traffic and the maximum earnings that could be gained by such readjustment of rates.

It is said that they should recoup their losses of freight traffic and earnings due to truck competition by themselves engaging in truck transportation, not merely to supplement their rail service, but for as long distances as freight is now handled by other truck operators. This would be to "meet competition" by operating trucks not only in competition with the trucks of other operators, but also in direct competition with their own rail lines. Their truck lines would then get the benefit of as large subsidies as those enjoyed by other truck lines, but in order fully to meet the competition of other truck lines they would have to adopt the same wages and working conditions, disregard the convenience and safety of private motorists to the same extent, and practice the same discriminations in service and rates. The results would be the same as the operation of truck lines by other operators—increased taxation of the public and private motorists to pay part of the costs of transportation, increase of the discriminations in service and rates which it was originally the principal purpose of railway regulation to stop, increased diversion of traffic from the rails to truck lines which would handle it at a greater total cost than it could be handled by rail, and imposition upon the general public of a greater total burden of transportation costs than would be economically justifiable.

The increased diversion of traffic from the rails to the railway-owned trucks would increase the unprofitableness of the rail lines, and unless part of the rail lines were torn up, or their losses were more than offset by profits derived from the truck lines, the railway companies would be as badly off, or worse off, as if they had left the long-distance trucking business to other operators. It is notorious that at present most operators of trucks who are hauling freight long distances are not making any money, in spite of the subsidization and lack of regulation of which they are the beneficiaries. Why assume, then, that the railways would derive large profits from long-distance trucking? The argument that the railways should "meet truck competition" by engaging in long-haul trucking is advanced principally by truck manufacturers; and its acceptance would increase the profits of the truck manufacturers rather than of the railways.

Competition and the Public Interest

Railroad companies should be allowed to engage, and should engage, in the general business of furnishing transportation, rather than confine themselves to furnishing merely rail transportation. To urge them to do this, and to urge them to "meet competition", are, however, two entirely different things. It is contrary to the public interest for them to "meet competition" which is entirely unfair, and which, because it is unfair, they cannot meet without reducing the earnings that should be made by their rail lines and increasing the total burden of transportation costs that the public must bear. The public, in its own interest, should first make competition fair between carriers by rail, water, and highway by withdrawing all subsidies

and applying similar regulation to all carriers. Then the railways, with due regard to their own interests and those of the public, could and, if permitted, would meet all competition either with their rail service and rates or with service and rates provided by auxiliary and co-ordinated means of transportation.

Those who now urge the railways to "meet competition" usually are trying to promote their own selfish interests or do not understand present competitive conditions and the reasons for their existence. The railways are as willing and able to meet competition as any other American industry; but no American industry ever has, does now or ever will uncomplainingly submit to such competitive conditions as are forced upon the railways by the present unfair and unwise use of the taxing and regulating powers of the state and national governments.

How Secure Economies in Accounting Work?

As the fifth installment in the series on operating economies we present on another page an article entitled "Centralized Machine Accounting for Better Records, Lower Costs." This article is an abstract of a paper prepared by J. C. Wallace, general auditor of the Big Four, for the recent convention of the Railway Accounting Officers Association in Chicago. It is as eloquent testimony as could be desired in behalf of the improved records and operating savings which modern machine accounting makes possible. Later on, other articles in the series will still further elaborate, from other sources, this subject so well introduced by Mr. Wallace's paper.

It should be noted that the Accounting Officers Association has officially recognized the importance of this subject, and its committees have done a great deal of hard work in studying and making reports upon it.

As an instance of this may be cited the inclusion in the report to the convention of the Committee on Disbursement Accounting of a treatise of 33 printed pages dealing with the use of accounting machines in disbursement work—virtually a manual of practice. At the convention of the association in New Orleans last year an able paper on the application of centralized accounting for freight receipts was presented by A. J. Moran, auditor of freight accounts of the Erie. The subject, therefore, is one the importance of which has received the highest possible professional endorsement. In other words, the railway accounting departments are alert to the situation and are plainly as open to the adoption of new methods which can prove their worth as are any other departments of the railroad.

The purpose of the series of articles on operating economy is to call the attention to the best methods in use in the various departments, with the implication that up-to-date practices profitable to some railroads might be just as profitable to all. A further purpose of the series is to show the wide range of improved methods and machinery available to the industry. No one department has a monopoly on possibilities afforded it for more economical performance. At the same time, dollars for new equipment never are over-plentiful, and the departments and equipment manufacturers which now make the best showing of the savings which invested dollars will effect, will probably be the ones to whom the larger share of investment dollars will go when buying revives. The *Railway Age* in its series is endeavoring to cover the whole industry broadly. The extent to which available funds for new and improved devices are authorized for any particular department, however, will depend largely upon the activity of that department and the manufacturers who cater to it in attracting the attention of the industry to its situation and the possibilities it affords for profitable employment of the necessary capital.

The present is certainly a time when the whole railway industry, with the co-operation of the manufacturers who supply it with equipment, should concentrate its energies upon discovering new methods of securing operating economies in every possible manner consistent with adequate service. Devotion to this goal offers the brightest promise for returning prosperity to the industry as business emerges from the doldrums.

The Locomotive As An Advertising Medium

An article by an engineer who has acquired considerable reputation as an artist in the field of commercial advertising was published in the *Railway Age* of July 25. A number of the etchings and sketches that have appeared in the advertising pages of past issues of the *Railway Age* are the results of his handiwork. Railroad scenes, especially those featuring locomotives and cars, have been his special hobby for many years. The suggestions which he gives to "make the locomotive beautiful" are the result of serious study, always from the viewpoint of the artist.

Doubtless the "dyed-in-the-wool" railroad man will resent any reflection on the appearance of our modern steam locomotive. To him there is nothing more beautiful than a Pacific or a Hudson type locomotive in action. Mechanical department officers can find many objectionable features to the somewhat fantastic design which the artist-author has proposed. There are

problems in connection with inspection and maintenance of which the artist is apparently ignorant. Safety appliance rules have been disregarded. The factor of wind resistance is entirely uncertain in the proposed design.

In reading the article, therefore, one must keep in mind that the author is thinking solely in the realm of advertising and the influence of competition. He is not looking at the locomotive with the eye of a railroad man, but as a layman with a vision of the possibilities for beauty in machinery. The airplane is streamlined and the automobile and bus, to a large extent, follow streamlines in the body design. Some of the ultra-modern designs of motor highway vehicles approach the fantastic in this respect.

The article contains one thought, however, that is worth stressing. From a comparative standpoint, the cars in passenger trains of the de luxe type have received considerably more attention than the locomotive hauling the train. After all, where is the romance and the appeal to the layman—in the cars or the locomotive?

To Our Canadian Readers

We are informed that, in accordance with present plans, on September 1 the new Canadian tariff on periodicals will go into effect. The rate on magazines such as the *Railway Age* is to be, according to our information, 5 cents a copy, making the total $2.60 a year—a rather sizeable levy when compared with the annual subscription price of $6 a year. The *Railway Age* would not presume to form an opinion as to the wisdom or propriety of the duty to be imposed. It does, however, feel obligated to its many Canadian friends to call this matter to their attention, since their interests, fully as much as ours, are involved.

The *Railway Age* is a highly specialized publication—dealing with all phases of railroad work, primarily from the viewpoint of executives and operating officers. Associated closely with it are five monthly publications dealing in a still more specialized manner with five technical branches of railroading. This group of railway papers gives to its readers a higher degree of concentrated attention to their particular problems than—to the best of our knowledge—is to be found anywhere else in the transportation world.

Such specialization in business and technical journalism is only possible in the case of any single country when its industry attains magnitude such as that of the railroad network of the United States. Because, however, of the common language, the parallel growth of the American and Canadian railways along almost identical lines, and the hitherto ease of passage of the printed word in both directions over the international boundary, these publications have been able to offer the same type of specialized journalism to Canadian railwaymen as to those in the United States. Canada, of course, has its own business press which serves it well. Having, however, a smaller population on which to draw for readers, business journalism in the Dominion could not naturally be expected to attain to the degree of specialization reached in the United States. It is but natural therefore that thousands of Canadians have found the American journals dealing with specific industries a valuable supplement to their own excellent publications.

More than that: The *Railway Age* has never looked upon the Canadian railways as a foreign system. A locomotive of new design, a new terminal, better operating methods—any such developments by the Canadian railways have received just as prompt and just as complete attention in our columns as have similar developments on railways south of the international border. A competent correspondent—a Canadian journalist of the highest standing—regularly keeps our readers posted from Ottawa on matters affecting the Canadian railways which arise in Parliament and before the Board of Railway Commissioners. Our news editors know no distinction between American and Canadian railways in their manner of dealing with news events concerning them. We have always maintained the same subscription rates for Canada as we have for the United States, in spite of higher mailing costs. A large percentage of our advertisers are firms which maintain offices and factories in Canada as well as in the United States, so that their advertising stimulates business for Canadian firms in Canada the while it similarly stimulates business in the United States for manufacturers south of the border.

Canadian and American railwaymen in all probability afford the most encouraging example of international co-operation and friendship which the world knows today. Every American railway organization with which we are familiar accords full membership rights to Canadian citizens, who have always taken an active and distinguished part in the conduct of their affairs. American railway officers have as close and as friendly contacts with their Canadian brethren as they do with those of adjoining states south of the border. American railway lines penetrate Canada and still more so do those of Canada penetrate the United States. Toward the establishment and maintenance of this mutuality of interest, of self-evident benefit to all concerned, the *Railway Age* and its sister publications may, with all due modesty, assert that they have contributed effectively and to the best of their ability.

We recognize fully the right and duty of our friendly neighbor to regulate her affairs as may seem best to her. Still we believe that our Canadian readers will share with us our regret that our service to them is to be rendered more difficult and more expensive.

Centralized Machine Accounting for Better Records, Lower Costs*

Centralizing work makes profitable employment of machine methods possible—New uses constantly developing

By J. C. Wallace

General Auditor, Cleveland, Cincinnati, Chicago & St. Louis

CENTRALIZED departmental accounting has the advantage of improving the integrity of departmental accounts at a material reduction in cost by reason of mass production and the use of machines. It is a means of eliminating to a maximum degree duplication of accounting work, particularly between the office of the auditor of disbursements and separate divisional or departmental accounting offices, and in so doing removes from the office of the auditor of disbursements the originating of certain detailed accounting, leaving that office to perform only its proper duty of auditing expenditures.

Many Opportunities for Profitable Use of Machines

The committee on disbursement accounting of the Railway Accounting Officers Association in its report to the convention of that association in June, 1931, as published in the last paragraph on page 196 of the Agenda† for that convention under the subject, "Use of Accounting Machines in Disbursements Work", very appropriately calls attention to the fact that other uses not incorporated in the report are being made of accounting machines in disbursement work, and mentions the constant improvements and new features being added to these machines by the various machine companies. However, the omission does not in the least depreciate the fact that the committee also fully realizes that there are many undeveloped profitable uses of existing machines in departmental accounting work, and I feel confident that the centralized accounting organization, more than any other, is going to develop these uses and procure the economies they offer, as it is in this field of the expenditures work that we have the volume of detail accumulations of accounts and statistics.

Centralized accounting is in its infancy. The possibilities seem to be limited only by the distance the original records—such as time slips, material reports, etc.,—are required to travel to reach the accounting office, coupled with the time limit in which the accounting office is required to get out its accounting information and reports. In fact, there appears to be no reason why the central office cannot be so arranged as to handle efficiently and economically the accounting for an almost unlimited mileage. Experiences thus far indicate the most efficient centralized accounting organization should be subdivided into departments according to the classes or kinds of work being handled, rather than by the operating departments for which the accounting is done, each department supervised by a properly qualified head clerk reporting to the chief clerk and the head of the office about as follows:

Sub-division of a Centralized Accounting Organization with Functions of Each

Statistical and Statement Desk—Accumulate and complete accounting reports and statistics, including labor and material balance sheets, and journal entries for vouchers and bills.

Maintenance of Way Material Record and Pricing Desk—Maintain a record of M. of W. material on hand with prices, and price material issues, releases and transfers, showing the code numbers of the items of material.

Maintenance of Way Distribution Accounting Desk—Show on M. of W. labor, material and other reports the proper operating or other account to be charged or credited, and the code for the kind of structure and kind of work performed.

Accounting Engineers and Valuation Order 3 Desk—Follow on the ground the progress and proper reporting of road and equipment program and other special work: inventory completed jobs, furnish special statements of costs when called for as the work progresses, and compile completion reports.

Tabulating and Payroll Machine Desk—Operate the sorting, tabulating, payroll and checkwriting machines to produce the various statements, statistics, payrolls and pay drafts.

Equipment, Transportation and Stationery Price Desk—Maintain a price record of equipment, transportation and stationery materials and price the issues and transfers.

Equipment, Transportation and Stationery Material Distribution Desk—Assemble the issues of equipment, transportation and stationery materials and account for work on shop orders.

Timekeeping and Transportation, Equipment and Stores Labor Distribution Desk—Keep the time for all employees except in general offices and distribute to the proper operating or other accounts, the pay of employees in the transportation, locomotive, car and stores departments.

Voucher and Invoice Desk—Except for land and tax, law, freight and passenger accounting departments, handle for approval, verify rates, proportions, etc. and distribute to the appropriate account and subdivision of the account, all bills and invoices including purchase invoices, verify and number the vouchers after written and list same on control sheets and receive from auditor of disbursements copies of control sheets with copies of vouchers prepared by other departments.

Bill and Sales Order Desk—Prepare and number all bills except for land and tax, law, freight and passenger accounting departments and show proper distribution to accounts and sub-division of the accounts, and list same on the control sheets, and receive from auditor of disbursements copy of

* Abstract of a paper presented at convention of Railway Accounting Officers Association, June 23-26, Chicago.

† This volume of committee reports to the recent convention of the accounting officers in Chicago contains a detailed treatise on methods of accounting with the use of modern machines.

control sheets with copies of bills prepared by other departments.

Stenographic Desk—Write all letters, statements, vouchers and bills.

Comptometer Desk—Make all extensions, additions and verifications.

Tabulating Card Punch Desk—Punch and verify all tabulating machine cards.

A Net Saving of $90,000 Annually

Prior to 1922 the stores accounting on the Big Four Railroad had been centralized in one office, supervised by a stores accountant who reported to the general storekeeper. The locomotive department timekeeping and other accounting was centralized in the office of the superintendent of motive power under the immediate jurisdiction of an accountant who reported to the chief clerk to the superintendent of motive power, and the car department timekeeping and other accounting was centralized in the office of the superintendent of rolling stock under the immediate jurisdiction of an accountant who reported to the chief clerk to the superintendent of rolling stock. During the early part of 1922 the accounting for the locomotive, car and stores departments was turned over to the jurisdiction of the accounting department, without change of location of the stores accounting office, but the accounting forces in the locomotive and car departments were brought together in a separate office, headed by an equipment accountant. In the latter part of 1923 the stores accounting forces were consolidated with the equipment accounting forces with one man in charge under the title of stores and equipment accountant.

This consolidation up to April 1, 1930, netted a saving of 16 clerks and in addition absorbed the accounting for the locomotive, car and stores for the Cincinnati Northern, at which time 6 clerks were released on that road. On April 1, 1930, the maintenance of way and construction accounting which was being done in the various division engineers' offices and the transportation department station payrolls, vouchers and bills were brought into this central accounting office and the entire accounting for the locomotive, car, stores, construction, maintenance of way and transportation departments (with the exception of enginemen's and trainmen's payrolls which were already consolidated in the general superintendent's office) was put under the jurisdiction of one head with the title of departmental accountant.

The consolidation of accounts effected on April 1, 1930, netted a payroll saving in clerical hire of some $45,000 per year, and since that date the centralized accounting office has effected a reduction of 21 clerks, aggregating $28,000 a year, some of which of course, is due to reduced volume of work. From the payroll savings made there should be deducted the cost of equipment used, which amounts to approximately $11,000 a year. In other words, the net result of centralized accounting on the Big Four thus far approximates an annual saving of some $90,000 a year, regardless of the fact that locomotive, car and stores accounting had been centralized in each of the separate departments.

Research Into Further Applications

The developing of improved methods is constantly in progress in a centralized accounting office. At the present time on the Big Four we are developing the possibilities of:

Sorting together all timeslips for each individual for a pay period instead of posting the time daily on time sheets for day workers who make individual timeslips.

Timesheets on which are posted the daily time of employees who do not make separate timeslips that can be cut on a cutting machine to give a separate earning slip for each employee, which together with the earning slips for employees whose timeslips are sorted together instead of posting the time daily, can be sorted with the earning slips for the previous pay periods for each individual; so that at the end of the year the earning slips for all 24-pay periods of the year will be together for each individual, and when added, will give the total compensation for the year for reports to the internal revenue department.

The use of one set of tabulating machine cards prepared from the individual earning sheets for a pay period to produce the earnings for the payroll, the employees' service and compensation report, and other payroll statistics.

Without discontinuing the furnishing to the auditor of disbursements or general auditor the present detail of vouchers, bills and other journal entries, produce a consolidated journal entry, showing separately under each account the amount debited or credited from each source, such as payrolls, material, vouchers, bills, etc., and the total net debit or credit to each account.

Timekeeping and Payroll

The method being developed in timekeeping, payroll and payroll statistics includes the use of rubber stamps to mark on the timeslips of day workers who make separate individual timeslips each day, any time worked other than straight time at the employees' regular rate and also time to be paid for but not worked. Such marking on the timeslips other than the one-third hour lunch period for which pay is allowed certain employees, is required on less than 2 per cent of the timeslips. After these timeslips are so marked with these rubber stamps, they are sorted into trays with dividers between each employee's timeslips showing the employee's name, occupation and rate printed on the dividers by the use of the addressing machine, so that at the end of the pay period all the timeslips for each individual employee are together for the entire pay period.

At the end of the pay period these timeslips together with an individual earnings form with the employee's name, occupation, rate, etc., printed on it with an addressing machine for each individual are bradded together, the cardboard dividers remaining in the trays for use in sorting the timeslips for the next pay period and the timeslips with the earnings forms passed to the computing machine operators who add the hours for the different classes of service, extend into earnings and post the hours and amount for such different items in the proper place on the individual earnings form, which form has spaces for straight time, prorata overtime, punitive overtime, time paid for but not worked, etc., at the regular rate and in addition other rates if the employee worked under more than one classification or rate. These computations are then verified by another operator, after which the earnings forms with the timeslips attached go to the accounting machine card punch desk where machine cards are prepared for the different kinds of time and I. C. C. classifications.

A Modern Method for Payroll Accounting

A separate timeslip is not received for each individual in the maintenance of way and construction departments, in which departments one timeslip is made including the several employees in each gang. Also in the locomotive and car departments several employees work on a single piecework time against day work pay, the time of such employees is posted on timesheets. These timesheets are, however, so arranged that at the end of each pay period, they are cut on a paper cutter to provide a separate earnings slip for each employee. At the close of the pay period, the total of the hours and earnings at the different rates, and separately for

the kinds of time worked, are computed and verified by the computing machine operators, after which these timesheets go to the accounting machine card punch desk where machine cards are prepared to record the different kinds of time payments and separation of the various I. C. C. classifications.

The machine cards are first used to accumulate each employee's pay and print this on the payroll by use of the machine, there being no sorting for this operation, as the cards are maintained in the order of the payroll. The names, occupations, and rates are inserted on the payroll by the use of the addressing machine.

The pay drafts are produced by printing the name on the drafts with the addressing machine and inserting the earnings, check number and date of the drafts by the use of the check writer, which automatically produces a list of the drafts by number and amount, and the total for each payroll sheet or group of payroll sheets. The originals of these lists are transmitted with the drafts to the treasurer for his use as a list of drafts.

After the payrolls have been produced, the machine cards used in entering the earnings on the payrolls for each individual are sorted on the sorting machine to I. C. C. classifications and separated by kinds of time, such as straight time, overtime, etc., and the I. C. C. report of service and compensation and other payroll statistics are produced on the accounting machine. Just how far this method can be profitably extended has not yet been developed. At the present time we are applying it to the employees in the locomotive, car, stores, maintenance of way and construction departments.

This method of timekeeping does not in any way increase the work of distributing the payroll expense to the operating or other accounts, which on our road for the locomotive, car and stores departments is accomplished by use of the analysis machine, nor does it destroy any of the advantages of balancing the distribution with the payroll totals. In fact it results in a little more speed in posting on the analysis machine the distribution of the timeslips for the day workers that are sorted together for the payroll period for each individual and also enables the distribution clerk to obtain a total for each employee's distribution for the pay period and verify same with the employee's earnings slip without clearing the machine of the totals being accumulated for each account. This materially lessens the amount of time required to locate any difference between the total distribution and the total payroll, under the plan of accumulating the entire distribution for a day or pay period before totals can be obtained to balance with payroll amounts.

In Next Week's Issue

Have you ever considered the coach yard as a source of potential economies? The operations of cleaning passenger cars, inside and outside; of icing them, and of changing wheels and making other simple running repairs, usually performed with the aid of a few simple hand tools and facilities, in the aggregate involve substantial expenditures which, if not large in proportion to other phases of equipment maintenance, offer unusual opportunities for relatively large reductions. The next article in this series will show how investment in modern facilities to assist in the performance of these operations will pay for itself in a few months.

Details Can Be Changed to Meet Local Conditions

Several methods of handling the various accumulations of expenditures by use of the different types of machines available are in use on different roads; each producing economy, some more and others less according to how well the method followed is suited to the manner in which the basic information comes to the accounting office and the detail in which the accounting office is required to produce its accounting and statistical records.

This year's Agenda (see footnote on first page of this article) outlines sound and well defined principles of application, these being the result of the committee's investigation of the uses made of the different types of machines on several roads. These prinicples as outlined can well be used as a basic method, varying the detail operation to fit the condition in which the original information is received in the accounting office and the accounting and statistical requirements for completed work.

EDITOR'S NOTE—*Articles to appear later in the operating economy series will further elaborate the application of machine methods and the utilization of modern appliances in increasing the efficiency and reducing the costs of railroad accounting work and office operation.*

Freight Car Loading

WASHINGTON, D. C.

LOADING of revenue freight for the week ended on July 25 totaled 741,752 cars, according to the compilation of the Car Service Division of the American Railway Association. This was a decrease of 15,803 cars below the preceding week and a decrease of 177,549 cars below the corresponding week last year. It was 360,801 cars under the same week two years ago. Miscellaneous freight loading for the week of July 25 totaled 278,796 cars, a decrease of 7,145 cars below the preceding week this year, 76,131 cars under the corresponding week in 1930, and 149,981 cars under the same week in 1929. Grain and grain products loading for the week totaled 51,961 cars, a decrease of 8,166 cars below the preceding week this year and 11,666 cars under the same week last year. It was 18,156 cars below the corresponding week two years ago.

Forest products loading totaled 27,258 cars, a decrease of 633 cars below the preceding week this year and 14,349 cars under the same week in 1930. It was 40,535 cars below the corresponding week two years ago. Ore loading amounted to 35,848 cars, a decrease of 1,052 cars below the week before and 24,533 cars below the corresponding week last year. It was a decrease of 44,830 cars under the same week in 1929. Loading of merchandise less than carload lot freight totaled 212,153 cars, a decrease of 1,141 cars under the preceding week this year, 18,817 cars below the same week last year and 45,886 cars under the same week two years ago. Coal loading amounted to 112,291 cars, 3,147 cars above the preceding week but 28,446 cars below the corresponding

week last year and 48,773 cars under the same week in 1929. Coke loading amounted to 5,055 cars, an increase of 507 cars above the preceding week this year but 3,225 cars under the same week last year, and 6,906 cars below the same week two years ago. Live stock loading amounted to 18,390 cars, a decrease of 1,320 cars below the preceding week this year and 382 cars below the same week last year. It also was 5,734 cars under the same week two years ago.

Loadings by commodities for the week as compared with the similar weeks in 1930 and 1929 were as follows:

Revenue Freight Car Loading

Week Ended Saturday, July 25, 1931

Districts	1931	1930	1929
Eastern	166,523	204,485	248,590
Allegheny	141,953	183,277	225,746
Pocahontas	46,223	54,178	62,265
Southern	104,181	122,101	140,927
Northwestern	106,538	142,161	175,102
Central Western	114,793	140,618	165,474
Southwestern	61,541	72,481	84,449
Total Western Districts	282,872	355,260	425,025
Total All Roads	741,752	919,301	1,102,553
Commodities			
Grain and Grain Products	51,961	63,627	70,117
Live Stock	18,390	18,772	24,124
Coal	112,291	140,737	161,064
Coke	5,055	8,280	11,961
Forest Products	27,258	41,607	67,793
Ore	35,848	60,381	80,678
Merchandise L.C.L.	212,153	230,970	258,039
Miscellaneous	278,796	354,927	428,777
July 25	741,752	919,301	1,102,553
July 18	757,555	928,271	1,079,968
July 11	763,581	915,985	1,066,414
July 4	667,879	792,053	911,143
June 27	759,290	936,690	1,096,569
Cumulative total, 30 weeks	21,910,751	26,756,186	29,777,031

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 25 totaled 46,802 cars, a decrease from the previous week of 1,164 cars and a decrease from the same week last year of 12,621 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
July 25, 1931	46,802	22,042
July 18, 1931	47,966	22,311
July 11, 1931	47,765	20,828
July 26, 1930	59,423	29,082
Cumulative Totals for Canada		
July 25, 1931	1,443,834	809,323
July 26, 1930	1,767,320	1,034,767
July 27, 1929	1,984,576	1,258,066

Railroad Labor Leaders Protest Wage Discussion

WASHINGTON, D. C.

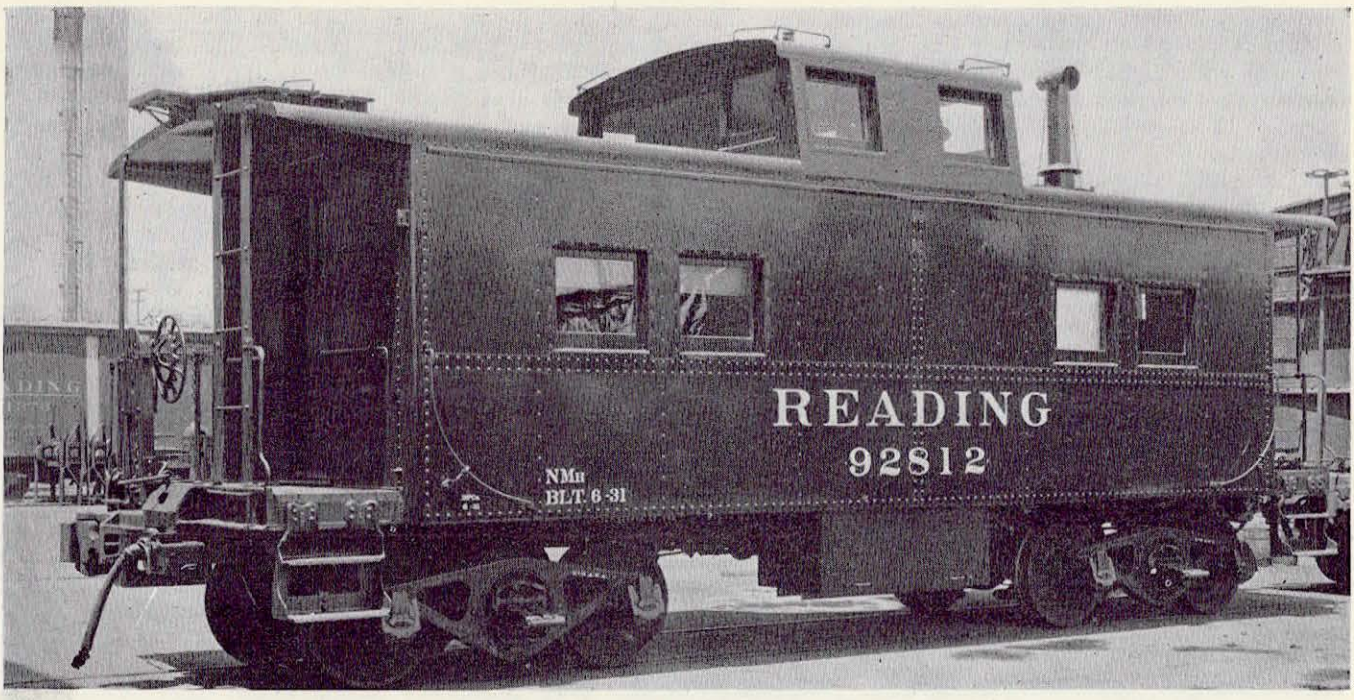
RAILWAY labor executives recently have expressed great concern because the question of a wage reduction has been injected into discussions of the pending application of the railroads for a 15 per cent general advance in freight rates. At the same time they have given the newspapers to understand that they are greatly disappointed because the Association of Railway Executives has declined to join with them in injecting proposals for a wage increase, through the medium of a six-hour day or five-day week, into a discussion of unemployment and plans for bringing about regulation of competing forms of transportation, although, of course, the wage aspect of the shorter working period has not been emphasized and the impression has been given merely that the railway executives are not co-operative. They have also made public plans for seeking compulsory pension legislation at the next session of Congress, on the theory that that would be somewhat apropos of the present discussion of stabilization of employment.

Although the Interstate Commerce Commission has announced that evidence concerning wage levels will not be received at the hearings on the rate advance, and although Commissioner Meyer promptly shut off discussion of that point on two occasions during the hearing, many suggestions have been made during the discussion of the case to the effect that the railroad financial situation requires a wage reduction rather than a rate increase, or that a movement to reduce railroad wages would be the only alternative if the commission should refuse the railroad application for a higher rate level. It has even been suggested, from labor sources, that the railway labor leaders are inclined to fear that the railroads have presented only a half-hearted case to the commission, as a necessary preliminary to a wage readjustment movement. This idea arises from the fact that the railroads, in seeking to have their case treated on a revenue basis, greatly curtailed their presentation of evidence and declined to discuss specific rates.

In connection with a three-day meeting of the Railway Labor Executives' Association in Washington last week a statement was issued to the press declaring that the railway labor organizations are "united and prepared to resist any such move with all the powers at their command," and that "they are also fortified with the solemn agreement between representatives of employers and employees and of the government of the United States not to permit the pressure of a business depression to be used as the excuse for breaking down the American standard of living and compelling men to labor for less than just compensation for their services." The statement also included an argumentative denial "that there is any justification for seeking to increase the net revenues through the process of reducing the wages of employees," based largely on the theory that, as the result of the large increase in investment in railroad property," every employee is producing a larger profit for the employer than ever before." It was also asserted that "the nation-wide depression of today has been caused by low wages" and that "an industry that has a constantly declining labor cost has no just claim to reduce wages."

Nothing was said in this public statement about the campaign for a six-hour day or a five-day week, which many of the labor organizations have endorsed but which has not been formally presented to the railroads. It is understood, because of the "solemn agreement" referred to, made at the White House toward the end of 1929. However, at the same meeting last week, the labor executives devoted much time to a discussion of the shorter work day and work week as "permanent preventives of unemployment," and it was reported in their newspaper "Labor," and thus got into the newspapers, that they were greatly disappointed at the declination of the Association of Railway Executives to join in the appointment of a joint committee to consider the general railroad problem, including the "elimination of unfair competition" and the "stabilization of employment," including the scheme for a shorter work period at the same rates of pay as for a longer period. This proposal was made to the association several weeks ago, in the Spring. In reply, R. H. Aishton, chairman of the Association of Railway Executives, reminded the labor executives that the association does not deal with labor matters and that it was the position of the rail-

(*Continued on page 204*)



All-Steel Caboose Built by the Reading

Reading Builds 20 Steel Cabooses

Equipped with one-piece cast-steel underframes—Overall length 33 ft. 10 in.—Berths for six persons

TWENTY caboose cars are now under construction by the Reading at its Reading, Pa., car shops. The design was prepared by the mechanical department of the railroad. The new caboose cars are of all-steel construction, with one-piece cast-steel underframes, yellow-pine lining and double floor. The length over the couplers is 33 ft. 10 in., while the body has a length of 25 ft. ¼ in. over the end plates. The maximum width over the steps is 9 ft. 6½ in. and the maximum clearance is 14 feet 9 in. The cars are carried on four-wheel cast-steel trucks having 5-in. by 9-in. journals and 33-in. chilled cast-iron wheels.

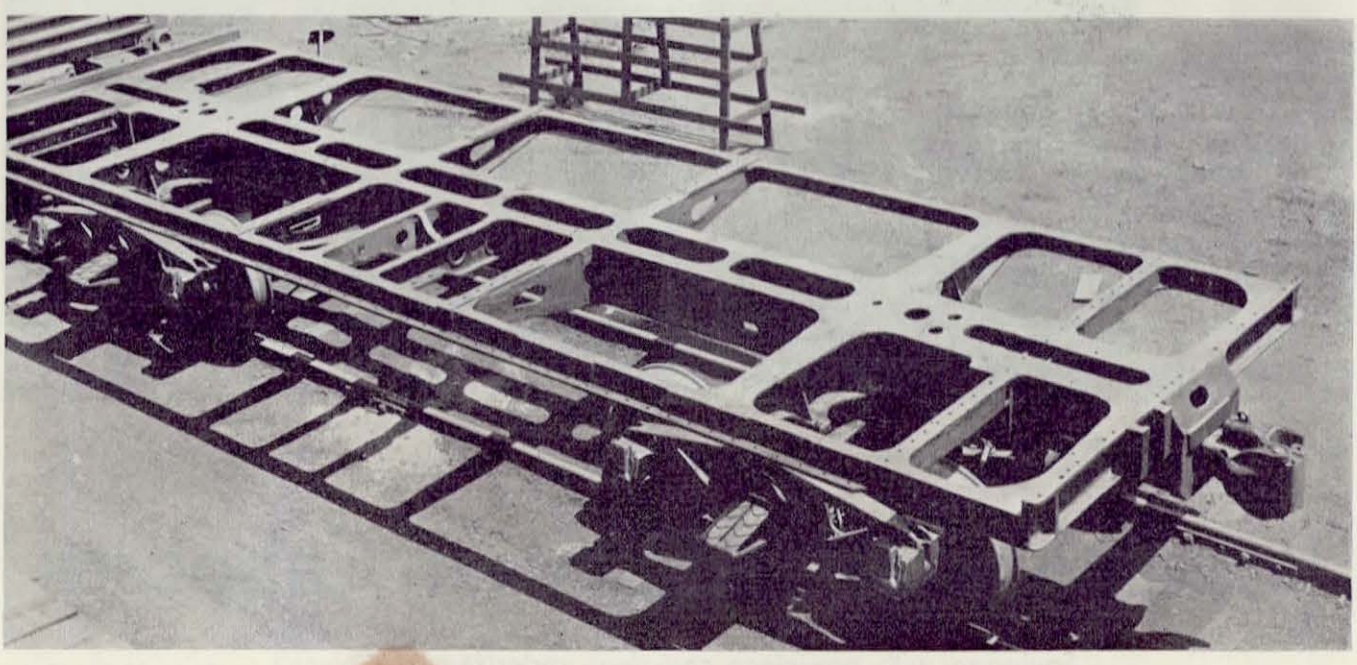
Each caboose has a sleeping capacity for six persons. Arranged along one side of the car is a desk, upper and lower berth, three lockers, another upper and lower berth, and a clothes closet. The middle of the three lockers is insulated and lined with galvanized iron for a refrigerator. On the opposite side (starting at the same end of the car) is a cooler for drinking water, water tank and wash basin, a 22-in. by 22-in. drop table, stove, coal bunker, three lockers, the middle one of which is lined with galvanized iron for the storage of journal packing; an upper and lower berth, and a clothes closet. The berth cushions are 4 in. thick and covered with 8-oz. black enameled duck, tufted and filled with curled hair.

The three lockers on either side are arranged underneath the lookout compartment, as shown in one of the illustrations. The clothes closets are 2 ft. 1 in. wide. A steel box, 12 in. by 12 in.. by 15 in., is built into the back corner of one of the closets for the storage of dry waste. Complete facilities for the comfort of the train crew and the conducting of the business pertaining to the operation of a train enroute are provided

Interior Showing the Locker and Berth Arrangement

and well arranged for maximum convenience. The lookout is placed on the center line of the car and is provided with eight sliding window sash. The four window sash on each side of the caboose are arranged to raise. The end doors are provided with two fixed glass lights.

Ajax hand brakes are applied on both platforms. The one-piece cast-steel underframe was furnished by the General Steel Castings Corporation. This underframe is arranged to facilitate the attachment of the air and hand brakes, piping, draft gear, superstructure, etc., with a minimum of labor and number of parts or pieces. It is machine finished on the outside of the side sills and on the top surfaces where the framing of the superstructure is secured. The underframe casting includes the end platform support with a center sill of heavy box section; area of 33 sq. in. The body center plates are machine finished and riveted to the underframe.



Cast-Steel Underframe of the Reading Caboose Cars

The trucks are of the Taylor flexible type with cast-steel frames and bolsters and elliptic bolster springs. These trucks provide full equalization and afford an easy-riding car.

The caboose cars are equipped with Westinghouse air brakes and friction draft gear, A.R.A. Type D couplers with Farlow attachments, Creco brake-beam safety supports and Stucki roller side bearings.

Railroad Labor Leaders Protest Wage Discussion

(Continued from page 202)

roads that such questions should be handled through customary channels; that is, primarily with the individual railroads. He added that he and Alfred P. Thom, general counsel of the association, had been appointed as a medium of contact with the organizations to facilitate co-operation on any matters within the scope of the association.

D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, has been quoted as saying that the labor executives have not yet decided what their next step would be but would probably meet in about two weeks to determine it. One plan under consideration is to seek pension legislation. At the meeting last week study was given to several plans and a special committee was appointed charged with the duty of having a pension or retirement insurance plan ready for introduction as a bill in Congress at the beginning of the next session in December. The committee includes E. J. Manion, president, Order of Railway Telegraphers; J. G. Luhrsen, president, American Train Dispatchers' Association; and B. M. Jewell, president of the Railway Employees Department, American Federation of Labor.

The position of the Interstate Commerce Commission that the wage question should not be injected into the rate case was further explained in a reply addressed by Chairman Brainerd to Ezra J. Warner, of Chicago, who had said in a letter that it had been reported that the commission had declined to receive in evidence a resolution of the Chicago Association of Commerce, "solely because we had suggested in our resolution that consideration should be given to the subject of wages." Mr. Brainerd in his reply said that letters, telegrams, resolutions, editorials and newspaper articles are not competent evidence, and while ordinarily received by the commission and filed, "form no part of the record upon which a decision can be properly based." Stating that the commission had announced that evidence would not be received in this proceeding regarding the level of railroad wages, Chairman Brainerd said: "It is considered by the commission that such evidence would not be pertinent to the inquiry and that if relevant it would, under the circumstances of this case, be impracticable to consider it in connection with the matter directly brought in issue by the carriers' application, which prays that we grant permission to them to file percentage supplements to existing tariffs increasing all freight rates and charges 15 per cent without complying with the ordinary rules of tariff publication."

Pennsylvania Adopts 152-lb. Rail

Demand for greater stiffness and longer life under increasing axle loads and higher speeds are met by the design of this heavy section

By T. J. Skilliman

Chief Engineer, Pennsylvania System, Philadelphia, Pa.

PROBABLY the most interesting development in rail design in recent years is that announced by the Pennsylvania of its 152-lb. section, the first heats of which were laid during May and June of the present year. Aside from its technical significance, the production of this rail, which is the heaviest and stiffest in regular use on any railway, constitutes an event of historic interest, since 1931 completes an even century in the evolution of the T-rail. It is of further interest in this connection that the original T-rail, imported from England on May 16, 1831, was designed for and used on the Camden & South Amboy Railroad, now a part of the New York division of the Pennsylvania.

For many years the trend in railway operation has been toward higher speeds, increased weight of locomotives and cars, and greater capacity and lading of freight cars, while the length of both freight and passenger trains has advanced steadily. Since the end of these developments is not in sight, the influence of all of these factors on the track structure is likely to grow rather than diminish in the future. Where the combination of increased loading and high speed with high density of traffic is encountered in maximum degree, the result already is the development of wheel pressures and the attainment of speeds which, from the standpoint of durability, are beyond the ability of the rail heretofore in use to withstand. The indications that this stage has been reached on certain definite territories are given by the shortened life of the rail, the increased number of rail failures and the magnitude of the annual expenditures which must be made to maintain smooth-riding track. These indications are also supplemented by deficiencies in splicing as the result of insufficient depth of the splicing area.

Such indications having become obvious, and their occurrence having been noted in a sufficient number of instances on certain parts of the Pennsylvania system which carry the densest traffic, it became apparent that a review of the operating requirements was necessary in order to arrive at a solution of the problem of designing a rail that would meet the demand for a stronger track structure, which would also have smoother and more comfortable riding qualities, capable of carrying safely increased traffic producing greater wheel pressures, at higher speeds, and which at the same time would result in more economical maintenance.

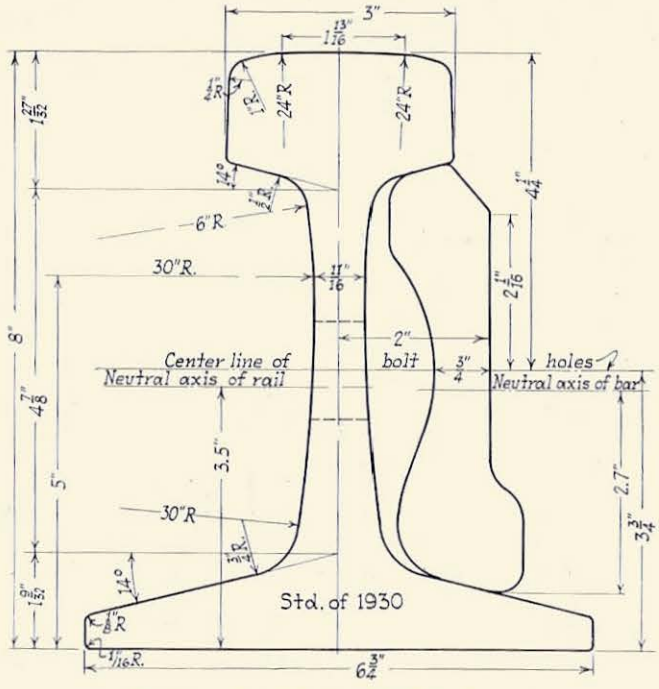
Accordingly, committees were formed which included representatives of the United States Steel Corporation, the Bethlehem Steel Corporation, and the Pennsylvania. These committees made thorough reviews and analyses of the problem as a whole and of its various phases. As a result of these studies, it was determined that the proper objective was a rail that would safely and satisfactorily withstand an axle load of 100,000 lb. moving at a speed of 100 m.p.h. This contrasts with an axle loading of 80,000 lb. moving at a speed of 80 m.p.h., which was the service for which the 130-lb. rail was designed that has been standard on the Pennsylvania since 1916. It was the conclusion of these committees that the increased allowances for speed and loading will meet the requirements of transportation developments during the next 25 years.

As the next step, the chemical composition and physical attributes, such as stiffness and strength, were fixed. A design was then developed which would most nearly meet these requirements. Calculations were made to determine the stresses that might be expected from a purely theoretical standpoint. As a result of the studies made at this stage of the investigation, it was demonstrated that it would be necessary to incorporate the following features, among others, in the design.

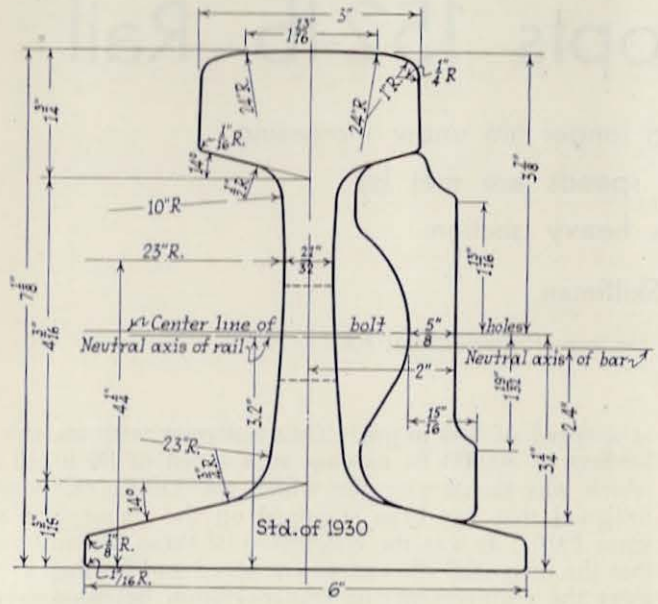
1—A height of approximately 8 in., which is 1⅜ in. higher than the 130-lb. section heretofore the standard on this road, as an important element in increasing the stiffness of the rail.

2—A head designed with a radius as great as would be practicable from a manufacturing standpoint, in order to give a broad contact with the wheel tread.

3—A definite desirable ratio of the perimeter of each part of the rail—that is, the head, the web and the base—to their respective volumes, so that the rate of cooling of all of these parts should be as nearly even as possible,



The Pennsylvania's New 152-Lb. Section

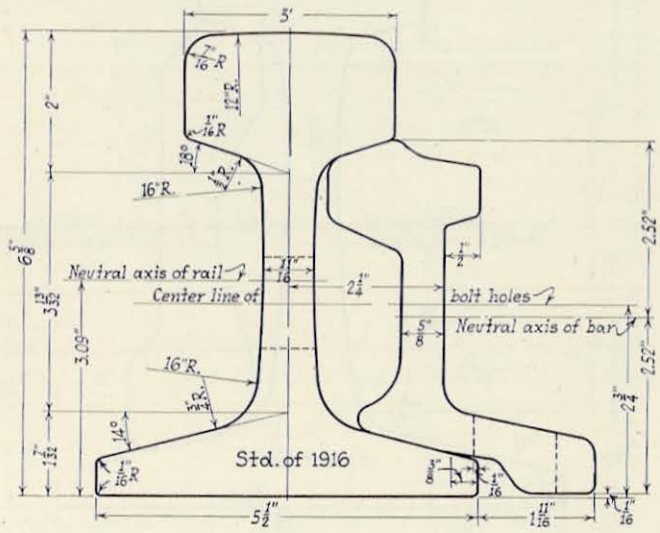


New Standard 131-Lb. Rail Which Replaces the 130-Lb. Section

in order to minimize the creation of internal stresses as a result of cooling.

4—Provision for canting the rail, and that this should be done in the ratio of 1:40 by the use of a canted tie plate, as a further means of insuring a better contact between the head of the rail and the tread of the wheel.

In developing a design to meet all of these requirements, there was produced a section weighing 152 lb. to the yard, which has 75 per cent greater stiffness than the 130-lb. section used previously. The investigation of the most desirable shape of the head to provide a running surface in which the initial stress will be held to a minimum, included a study of the contours of the wheel treads on a large number of cars in active service and the determination of the average contour of those studied. From this study, it was found that a radius of 24 in. most nearly fit the average contour that would be practicable to roll. Observation of the behavior of the rail in the track up to this time indicates that the contact between the running surface of the rail and the wheels has been extended materially, as compared with other rail sections, so that it is believed that this objective has been attained.



The 130-Lb. Section Which Has Been Superseded by the 131-Lb. Section

The chemical composition of the new rail is as follows: Carbon, 0.70 to 0.85; manganese, 0.70 to 1.00; phosphorus, 0.04 or under; silicon, 0.15 to 0.30.

As a result of the knowledge gained in designing the 152-lb. section, the 130-lb. section has been redesigned to accord with the principles of the new design. The result of this revision has been a section having 22 per cent greater stiffness, with an increase of only 1 lb. in the weight per yard. The new 131-lb. section will supersede the 130-lb. section and hereafter will be the standard for main-line track, except where the conditions of traffic require the use of the 152-lb. section. The latter is now being laid at various points between New York and Pittsburgh, and its use on the main east and west and north and south stems of the system will be extended progressively, to replace existing lighter sections, as conditions of traffic and wear warrant.

Reference has been made to deficiencies in splicing. These were met by utilizing the greater fishing space provided by the higher web of the new section. It was thus possible to design a simpler but more effective form of splice which it is believed will result in a much improved rail joint. In particular, features have been introduced into the design which produce greater vertical stiffness, as well as lateral resiliency. The latter makes it possible to take up the wear that occurs between the underside of the rail head and the top of the splice.

Reading's Testimony on Traffic and Purchases

THE Interstate Commerce Commission, on July 30, heard testimony at Philadelphia of officers of the Reading Company, in its investigation into the relationship between traffic solicitation and railway purchases. W. P. Bartel, director of the Commission's Bureau of Service, presided, with Examiner List appearing as attorney for the Commission—C. T. Wolfe, assistant general solicitor of the Reading, conducting the case for that company. Just prior to the close of the hearing, the Commission entered as exhibits a vast array of mimeographed copies of correspondence which its investigators had taken from Reading files. This correspondence included letters dealing with the purchase of coal, cement, various metals, rubber goods, electrical apparatus, lumber, oils and gasolines, paints and miscellaneous correspondence. The hearing was then recessed to September 1, at 10 A. M., at Washington, D. C., to give Reading officers the opportunity to study the exhibits prior to being called upon to testify regarding them.

E. D. Hilleary, vice-president in charge of traffic, was the first witness. In response to questions by Examiner List, he briefly described the organization of the traffic department and stated that it maintains a contact with the purchasing department, but that he did not recall ever asking that department to remove a name from its list of approved manufacturers. The purchasing department, he said, supplies the traffic department with information regarding all purchases, which information is distributed among the solicitors who come in contact with these manufacturers. This advice is given solicitors purely as information and not for use

(*Continued on page 208*)

Increasing L. C. L. Freight Traffic*

Pick-up and delivery service, advertising of service improvements, overnight deliveries and faster schedules called for to meet competition

By George A. Powell

Trans-ship Clerk, Canadian Pacific, Smith's Falls, Ont.

AS I write, I have before me two waybills. The first covers a shipment of 570 lb. from Montreal to Smith's Falls. The Montreal cartage advanced against the goods is $1.25, and the destination cartage is 50 cents, making a total of $1.75 for cartage charges alone. Had this shipment moved by truck, the consignees would have saved this entire amount and the total haulage charges assessed by the transport company would have been considerably less than the freight charges collected by the railway company. The second waybill covers a small shipment from Ottawa to Smith's Falls. The freight on the consignment is the minimum of 50 cents; the cartage at the originating point is 40 cents; and the destination cartage is a further 30 cents. In this instance, it cost the purchaser of the goods 50 cents to have them brought a distance of 48 miles, while at the same time he was obliged to pay 70 cents for having them carted a distance slightly over a mile and a half. A trucking company offers to pick up this same shipment from the consignor's plant in Ottawa and deliver it to the store door of the consignee for a total charge of 50 cents. Is it any wonder that the l.c.l. freight business of the railways is fast declining?

The railways must immediately make drastic changes in their method of handling l.c.l. freight, for every day more and more business is being permanently lost by the steam roads. The railways must at once make arrangements for the carting of goods at both originating and destination points at a very small, if any, further cost to the owners of these goods. This is a matter that has long been under consideration and has been given a partial trial on some of the more progressive railways in the United States, but surely in a matter of such vital importance as the increasing of our l.c.l. business the time for hesitation is past and steps should be taken without further delay to preserve this important contributor to the railway revenues. The additional cost of providing this extra service would not be as great as would appear at first sight. The railways have an advantage in having every facility necessary to the prompt handling of these small shipments, and there is not a department on any road which could not handle a 100-per cent increase in business with very slight additional cost.

Facilities Are Available

In practically all our cities and towns, we are maintaining expensive express delivery and pick-up systems which, in very few instances, are ever worked to capacity. These systems could be utilized in carting freight, and any additional units which it would be found necessary to add, I believe, could soon be classed as profitable investments, since the l.c.l. freight business of the railroads would increase to many times its present proportions. One very attractive feature of truck transport is the number of hours over which the companies are prepared to handle business, and thus enable a shipper who is hindered from preparing his goods for shipment before the normal closing hour of the warehouse to forward them during the evening hours without loss of time. Arrangements should be made to operate these pick-up units of the railways for special calls during the evening hours and to handle the goods so secured as quickly as possible.

It has often been suggested that a private company would be in a better position to handle the cartage business than the railways themselves, but it is my opinion that the railroads should be wary of having this service performed by any organization not under their direct control. The impression that a shipper receives of a railroad is due to a certain extent to his contact with its carting agents, and we have ample evidence today of the harm that can be done to the roads entering into long-term contracts with private transport firms. The high cost of city haulage is almost invariably blamed upon the railroads, and it is an almost impossible task to convince some of our patrons that the railways are simply advancing the charges which have been paid by them to the cartage firms.

The great majority of wholesalers who deliver throughout the country by means of their own trucks do so only because their customers demand delivery of purchased commodities at their warehouse or store doors, and if the railways would adopt a pick-up and delivery system as outlined above, it takes no prophet to foretell that there would be such an enormous increase in business to the railroads—that peaks of prosperity never before dreamed of would be reached. The time is past when the railways could sit and wait for business to be delivered at their doors; if they would survive in this transportation war, they must be prepared to go out and get the business.

Advertise Service Improvements

No matter how much is undertaken to improve the dispatch of freight, and regardless of the improvements in the services rendered to our patrons, a great part of the public will remain in total ignorance of the advantages of shipping by rail unless we tell about them. For years, all our large railroads have spent immense sums advertising their passenger and express businesses, which show very small returns for the millions of dollars invested in them, but the mainstay of the roads, the freight business, has been entirely neglected. It is high time that we awaken to the fact that we must tell the people of the many advantages of shipping by rail.

* From the prize-winning paper in the Canadian Railway Club competition, read at the meeting of the club in Montreal, Que., on May 11.

It is not enough that we should know these advantages; they must also be impressed upon the shipping public.

A local agent can do much in soliciting business, but he cannot reach everybody, and it is only by advertising that the occasional shipper or consignee can be made aware of the advantages we offer. I have been informed of the case of a certain storekeeper who received occasional shipments by truck from a point some two hundred and fifty miles away. As these shipments were both bulky and perishable, the trucking company charged a rather high rate, and refused to be responsible for the deterioration of the goods. One day a railway agent in the course of his duties called upon this man and suggested that he get his shipments in by rail. The storekeeper claimed he could not do this as he would have to wait too long for his goods. When it was pointed out to him that the railway maintained a one-day service between the points in question, the man was quite surprised, since he was under the impression that all small shipments were loaded in way cars and, being stopped at all stations en route, would take about three days to cover that distance. Lack of advertising was to blame for the false impression held by that man.

Now let us see what improvements can be effected in the time taken in the main line haul and terminal delivery of freight which is moving by the railroads. There is always a delay between the time that a train arrives in the sorting yard and the time that the merchandise cars are placed at the freight sheds to be worked, and a certain amount of delay is, of course, inevitable. However, it should be our purpose to cut this to a minimum. All shed cars arriving at the larger terminals should be required to be spotted within one hour of time of arrival, and in the case of smaller terminals this time should be cut to half an hour. All instances where a greater time is permitted to elapse between the arrival and spotting of cars should be reported to the superintendent, who should investigate the cause of the delay and take action to prevent its repetition.

In certain districts in Ontario and Quebec, there are a great many towns and villages within a small area. L.c.l. freight consigned to any of the towns in such area is subject to several trans-shipments, each of which is responsible for at least one day's delay. To hasten delivery of freight in such districts, I would advocate the establishment of terminals about one hundred miles apart, and delivery by truck from these terminals to the surrounding towns. Let me illustrate by giving a specific example.

A certain division, with which I am familiar, extends for 90 miles, has a trans-shipping terminal at either end and has five large towns and about twenty smaller towns between the terminals. Over this division, both a swing train and a way freight are operated daily. As straight cars are made from several large centers to the towns in question, the freight in the way cars seldom exceeds 20,000 lb. at any one time, but this amount is fairly constant. As the highway in this district touches all the towns served by the railway, my plan would call for the cancellation of the way freight and the establishment of four trucks with trailers on this run, two operating each way every day. The heavy freight would be handled, as it is now, in straight cars on the swing train. Besides speeding up the delivery, about thirty new villages could be brought into the scope of the railway and the cost of providing service in this district would be greatly lessened as the cost of operating one way freight would soon pay for a great many trucks.

At present, practically all our way freights are operated during daylight hours, which means that there is a very considerable delay between the time cars are loaded at the freight shed and the time they are forwarded from the terminal. The result is, of course, that many stations do not receive the freight consigned to them until the afternoon of the day following shipment or transfer. Much time could be saved if all way freights were operated at night, as this would permit early morning delivery at all points. That this method of operation would be more inconvenient for the railroads is readily acknowledged, but this inconvenience must be met if they are to compete with the speedy delivery which the trucking companies are willing to furnish. The necessary changes in existing regulations could no doubt be readily accomplished if it were pointed out to all concerned that it would be in their own interests to operate trains in whatever way the prosperity of the railroads, and, incidentally, of their employees, demanded.

I have before me two time tables, one of each of our greatest railroads. In examining them, I find that it takes about nineteen hours for their scheduled fast freights to cover a distance of 325 miles. Fast passenger trains cover the same route and distance in six to seven hours. For years, no effort seems to have been made to decrease the running time of the freight trains, and yet, if a three-or-four-hour reduction could be made in the time taken over this 300 miles, it would mean a one-day service between two of our largest cities in place of the two-day service now existing. All the efforts of our mechanical departments for years past have been to build larger and more powerful engines capable of hauling enormous tonnage, but apparently little has been done to increase the speed of our freight trains. Trains of twenty and thirty years ago covered the distance just as fast as do those of today. Faster service is the crying need of today, and the railroads must furnish this service or suffer steadily increasing losses in business.

Reading's Testimony on Traffic and Purchases

(Continued from page 206)

as a "lever to unduly embarrass or harass" the prospective patron. No "high-powered" sales effort is put forth, he said. His department attempts to keep closely informed regarding the volume of traffic of shippers, with particular reference to what proportion of total traffic is given to the Reading. He felt that manufacturers located on the Reading lines, who give it their traffic, should receive prior consideration in company purchases, provided always that they can first satisfy the purchasing department as to quality and price.

"Reciprocity," he said, "has been so well founded for so many years, that it cannot be divorced from every-day business." It is not the principle of reciprocity, he continued, but its abuse, which gives rise to difficulties. Under questioning by Examiner List, the witness agreed that reciprocity would not increase the traffic of the railroads as a whole. He did not know whether the Reading had lost or gained traffic by the "decided growth" which has taken place in reciprocal traffic and purchasing relationships since the war. Questioned as to whether he knew, or had heard of, any abuses in connection with this practice, he answered that he had heard "street talk" about such abuses but could not be specific about them in view of the fact that they were hearsay only. Asked whether it was the Reading's

practice to endeavor to get shippers to disregard consignees' routing instructions, he stated that Reading traffic solicitors would use all legitimate sales methods to endeavor to get both shipper and consignee to route via their line, but that they did not try to induce shippers to violate positive instructions of consignees.

Describing the company's coal business, and its relationship to fuel purchases, Mr. Hilleary explained that, while the company naturally favors its patrons in orders for fuel, its assignment of orders is not based on any mathematical proportion of so many cars ordered for so many cars shipped. The policy is determined on broad lines. He stated that the traffic department's recommendations to the purchasing department regarding cement orders "are few and far between." He said that he had no information regarding the amount of cement required, but simply would tell the purchasing agent that he would appreciate it if such and such a firm might be given consideration in placing orders. However, the purchasing agent must first be satisfied by the manufacturer. The product must first be sold completely on its merits to the purchasing department. He said that he had never asked the purchasing department to pay any premium on any class of supplies and would not do so. He did not remember ever having been approached by any representatives of draft gear manufacturers, nor could he recall ever having made any recommendation to the purchasing department on the subject. No packers' representatives had called upon him to discuss the subject of draft gear.

The second witness was J. D. Landis, purchasing agent, who explained that the volume of purchases placed through his office totaled approximately $25,000,000 annually, exclusive of equipment, which purchases are handled by Vice-president C. H. Ewing. He stated that he investigated the reliability of firms before putting them on the list of concerns to whom inquiries were sent. He also investigated the quality of their products, relying on the experience of other railroads or placing a small trial order for test purposes. Some shippers supply him voluntarily with reports of business given the Reading, but he does not require this information from manufacturers with whom he has done business. The purchasing agent's first concern, he said, is with quality and price, and non-shippers will be favored over shippers on this basis if the shippers cannot meet these conditions. He stated that approximately 90 per cent of all materials purchased are secured on a basis of competitive bidding. This does not mean that the original lowest bidder is awarded the entire order. Other concerns who originally bid higher may be informed, if they seek the information, that their price is too high, without being told exactly how much too high. If they make another offer and their price is as low or lower than the original lowest bid, they may secure a part of the business.

Mr. Landis said that the company secures its bituminous fuel coal from three off-line fields. One-third of its coal purchases are anthracite, all of which is bought from on-line producers. About 75 per cent of bituminous purchases are placed on yearly contract. These contracts expire at different times during the year and at the present time there are 30 such. Contracts are placed by competitive bidding. There is, however, a variation in price because of a difference in the quality of coal. There may even be a difference in quality from mines working the same field—a difference due not only to varying intrinsic properties of the coal proper, but also a variation arising from methods of mining and preparing the coal. He explained that quality and price are the first consideration and that only if these are satisfactory is an operator's standing as a shipper over the Reading considered in placing orders. He explained that fuel contracts are referred to the president of the company for final approval, but that this practice has to do only with that officer's interest in the price to be paid; that none of the other officers of the company makes any change in the distribution of orders. Nor is there a "yard stick" which requires one car of coal to be purchased for a certain number of cars of commercial coal shipped.

Anthracite is purchased from seven operators on a monthly basis by competitive bidding. All producers are located on the Reading. Questioned as to whether some bituminous coal was purchased from operators who also produce anthracite, he answered in the affirmative, but stated that bituminous traffic was not considered in the placing of orders for anthracite. He was of the opinion that a contract for the purchase of the entire output of an off-line mine would be unwise. If anything happened to this producer the supply would be endangered, whereas if the business were distributed among several mines, the defection of one or even several of them would not endanger the supply.

Some question arose regarding purchasing methods and prices for distress coal taken over by the company. Was it the practice to charge the full freight rate on such coal to the point of destination, plus demurrage charges if any? This question was left open for further answer at the hearing in Washington.

The company purchases cement through competitive bidding, some on-line and some off-line, prices being f. o.b. the Reading company—in other words off-line producers absorb the freight charge which they must pay to get the cement to the Reading, in their quoted price. Some of the cement companies are trucking cement but the Reading has not taken any firms off its inquiry list because of this practice. Most lumber is purchased direct from the mills, always under competitive bidding. Steel rail is purchased from the Bethlehem and Carnegie Works, both quoting the same price f.o.b. Bethlehem is an on-line concern, but Carnegie is not, so that rails purchased from Carnegie involve some freight charges in addition to the price paid. Mr. Landis explained that it was the policy to purchase only a small proportion of off-line rails, but that he felt it was a good policy to secure rail from more than one mill so that there might be some comparison; and he believed that the company had secured better rail as a result of this policy, than it would have otherwise.

He said that the company had two standard draft gears, the Miner and the Waugh-Gould, but that he had never conferred with any representatives of packing concerns on the subject of draft gear, nor had the traffic department ever approached him on the subject. No premium was ever paid for supplies because of traffic considerations or for any other reason, except that somewhat higher prices for better quality might be allowed. The witness explained that he did not handle equipment purchases, and only specialities required for equipment when he could secure these specialities at a lower price than those quoted by equipment manufacturers to Vice-President Ewing.

At the conclusion of Mr. Landis' testimony Mr. Hilleary was recalled as a witness on the subject of trucking by cement manufacturers. He expressed a belief that these manufacturers were studying their transportation problem, and would be able to work out a basis whereby the railways would secure a proper consideration in the transportation requirements of cement companies. He added, however, that trucking of all classes of commodities is becoming an extremely serious prob-

lem. Between New York and Philadelphia, for instance, he said that every variety of goods was trucked, including structural steel. A great deal of anthracite is being handled by truckmen who act not only as transportation agents, but also as coal dealers. He felt that a great deal of trucking was entirely legitimate and shippers were justified in using this form of transportation in many instances. He urged, however, that something be done to place the trucks and the railroads on a more even basis so that each would have a fair chance to secure that traffic which each is best fitted to handle economically.

Slightly Less Wood Given Treatment in 1930

DURING 1930, a total of 332,318,577 cu. ft. of wood was given preservative treatment, according to the statistics of wood preservation prepared by R. K. Hephenstine, Jr., forest service, United States Department of Agriculture, in co-operation with the American Wood Preservers' Association. This volume represents a decrease of only 8 per cent as compared with 1929, the peak year in this industry, and a decrease of only 1 per cent as compared with 1928, and has been exceeded in only 3 of the 22 years that records have been kept, beginning with 1909.

As in previous years, crossties and switch ties comprised the bulk of the wood subjected to treatment, the total in 1930 being 204,424,034 cu. ft., or nearly 62 per cent of the entire volume of wood treated. Included in this total, 14,622,713 cu. ft. represented the volume of switch ties, and is the only item that showed an increase for the year.

Statement of Material Treated by Classes (Cu. Ft.)

	1930	1929	Increase + Decrease —
Crossties	189,801,321	213,069,309	—23,267,988
Switch ties	14,622,713	14,425,642	+ 197,071
Piles	17,027,153	17,126,794	— 99,641
Poles	75,258,146	77,154,317	— 1,896,171
Wood blocks	5,012,445	6,852,130	— 1,839,685
Crossarms	1,299,246	1,957,431	— 658,185
Construction timbers	19,013,369	20,203,811	— 1,190,442
Miscellaneous	10,284,184	11,219,613	— 935,429

From the standpoint of quantity treated, oak ties again occupied first place by a wide margin, with 21,040,750 out of a total of 63,267,107 ties. Southern pine came next with 16,943,501, while gum and Douglas fir ranked third and fourth with 5,658,894 and 5,058,252, respectively. These four species constituted 77 per cent of all of the crossties treated in 1930, and were followed in order by lodgepole pine, maple, beech, western yellow pine, birch, tamarack, hemlock and elm, with quantities ranging from 2,838,276 for lodgepole pine to 206,545 for elm.

Sixty-two per cent, aggregating 39,059,947, of all crossties treated in 1930 were treated with creosote; 16,358,893 or 26 per cent were given treatment with creosote-petroleum mixtures; 10 per cent with zinc chloride and 2 per cent with a mixture of creosote and zinc chloride. The sawed ties numbered 30,009,883, while 33,257,224 of the ties that were treated were hewed.

Poles fell short of the number treated in 1929 by about 2.5 per cent. Although the total number treated was lower, the number of southern pine poles increased 421,501 to 2,428,173, or by 21 per cent, making 1930 the fourth consecutive year that the number of poles of this species have exceeded the combined aggregate of all other species. All but 172 of the southern pine poles were given full-length pressure treatment.

There were a total of 215 treating plants in the United States in 1930, of which 204 were active and 11 were idle, this being an increase of one active plant. Four new plants, three less than in 1929, were constructed. Of the active plants, 134 were of the pressure-cylinder type, 53 were non-pressure (open tank) and 17 were equipped for both methods of treatment.

Corresponding with the smaller volume of wood given preservative treatment, the quantity of creosote consumed for this purpose decreased 5.5 per cent, as compared with 1929 which was the record year for the wood-preserving industry. Of the total of 213,904,421 gal. consumed, 145,595,733 gal. or 68 per cent was of domestic production, this being the largest consumption of domestic creosote ever recorded. On the other hand, the consumption of zinc chloride fell to 13,921,894 lb., a decrease of nearly 30 per cent, as compared with 1929, which is explained in part by the lessened use of this salt in the treatment of ties, since its consumption in the treatment of other classes of material in 1930 increased over 1929.

Treatment of Miscellaneous Materials (Ft. B. M.)

	1930	1929	1928
Lumber	76,244,055	87,972,030	64,426,979
Fence posts	17,843,001	10,904,180	7,272,422
Tie plugs	1,779,215	2,018,147	1,747,026
Car material	753,440	942,243	542,024
Crossing plank	2,552,370	273,588	1,460,463

During 1930, as compared with 1929, there was a decrease in the quantity of petroleum used in wood preservation, amounting to 1,555,865 gal. or 5.2 per cent, although the 28,100,316 gal. consumed exceeds the quantity for any year except 1929. The total quantity of miscellaneous preservatives used in the treatment of wood in 1930 consisted of 1,770,925 lb. of salts and 202,891 gal. of liquids. The salts comprised sodium fluoride, sodium arsenite, sodium chloride, arsenic trioxide, zinc-meta-arsenite, mercuric chloride and Wolman salts. The liquids included Ac-zol, montan wax and Carbosota. These figures indicate an increase of 49 per cent in the use of salts and more than five times the quantity of miscellaneous liquids reported last year.

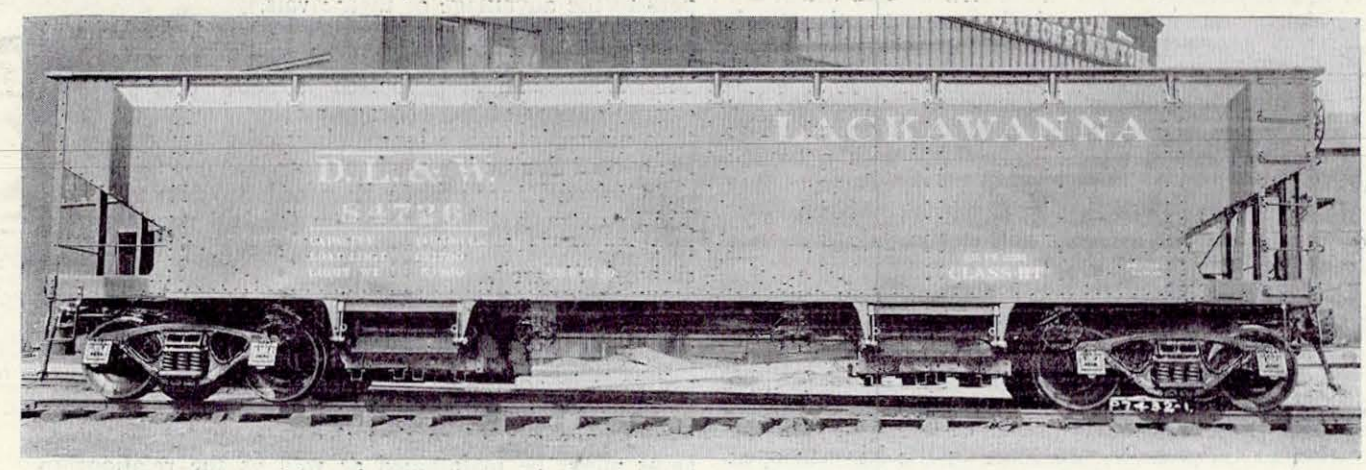
The table of selected items taken from the tabulation of miscellaneous materials shows large increases in all classes of materials as compared with 1928 and large increases in fence posts and crossing planks as compared with 1929, with relatively small decreases in lumber, tie plugs, and car material.

Wood Preservation, 1909-1930
Together with Consumption of Creosote and Zinc Chloride

Year	Total Material Treated, Cu. Ft.	Number of Crossties Treated	Creosote Used, Gal.	Zinc Chloride Used, Lb.
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,931,056	32,394,336	83,666,490	20,751,711
1913	153,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,060,994	37,567,247	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360
1922	166,620,347	41,316,474	86,321,389	29,868,639
1923	224,375,468	53,610,175	127,417,305	28,830,817
1924	268,583,235	62,632,710	157,305,358	33,208,675
1925	274,474,538	62,563,911	167,642,790	26,378,658
1926	289,322,079	62,654,538	185,733,180	24,777,020
1927	345,685,804	74,231,840	219,778,430	22,162,718
1928	335,920,379	70,114,405	220,478,409	23,524,340
1929	362,009,047	71,023,103	226,374,227	19,848,813
1930	332,318,577	63,267,107	213,904,421	13,921,894

Revenue Hopper Cars Made Equally Adapted for Ballast Work

A SPECIAL arrangement of bottom doors and side gates for standard hopper cars is being offered by the Magor Car Corporation, New York City, which adapts these cars for maintenance-of-way ballasting work, with features of flow control and selective distribution, without affecting their adaptability for regular revenue service. In fact, the flow control feature of the new design adapts the cars also to certain classes of revenue service, such as the unloading of coal and certain building materials at local yards where it is desired that the flow from cars be regulated to the capacity of mechanical conveying or truck-loading equipment. The new door and gate features, which the company is prepared to embody in new car construction or to apply to existing cars, replacing the usual type of door equipment, do not affect the volumetric capacity or weight of the cars, and, while designed to permit the regulation of discharge, do not restrict the bulk unloading of materials. Thus, cars embodying the new features are interchangeable between revenue and maintenance of way service without the necessity for making alterations or adjustments.



D. L. & W. 70-Ton Hopper Car Fitted with Magor Bottom Doors and Side Gates Suitable for Revenue Service or Ballast Distribution

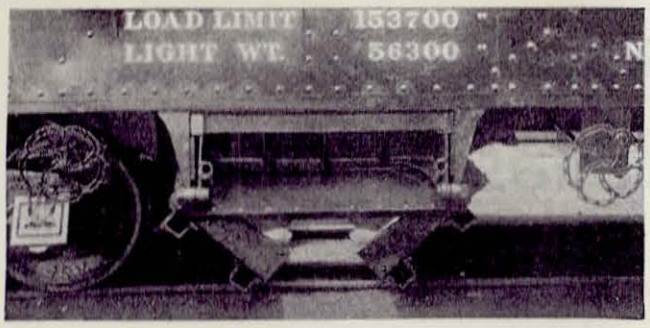
Essentially, the new design converts the lower part of each of the V-shaped hoppers of a standard car, with its hinged door opening, into a rectangular-shaped hopper with two drop doors, and adds down-cut discharge gates on each side of the car, directly in line with the bottom openings. The rectangular-shaped hoppers of the new design, like the V-shaped hoppers of the standard car, are divided into two units by the center-sill construction of the car.

The operation and control of the new bottom doors are effected mechanically through shafting and gears, from the side of the car, and in such manner that the flow of material can be increased or decreased at will during dumping, and actually shut off entirely, if desired. The side gates provide wide and deep openings, the depth of which can be altered at will by the operator during the flow of material, even to the extent of stopping the discharge entirely. Through these features, ballast can be unloaded on to the track in the exact quantity desired at various points, on one or both shoulders alone as needed, throughout the length of the ties alone, if desired, or over the entire width of the track.

The doors under each main hopper are of heavy steel-plate construction, reinforced on the bottom, and are provided with vertical flanges on the sides and rear to give them a tight seal when closed and to confine the flow of the material laterally when opened. Each of the two doors are mounted on and keyed to a trunnion transverse to the car, which brings the doors together in a horizontal plane when closed, and inclined downward, away from each other, when opened.

Operation of the door in each case is effected by means of a hand wheel at the side of the car, which is connected mechanically to the door through shafting, a pair of beveled gears, and, immediately at the door trunnion, through a worm and gear segment. Through this mechanical arrangement, in which all parts are accessible and protected beneath the car, the doors can be opened and closed easily. On the other hand, the loading on the doors and the gear ratio provided in the operating mechanisms are such that the doors hold themselves rigidly when closed, or at any degree of opening, regardless of the load condition. To insure positive locking of the doors during the road haul of material, a ratchet and pawl with a cam pawl keeper are provided directly at each hand wheel. Ease in the operation of shutting off or reducing the flow of material by closing the hopper openings has been effected through the pivoting of the doors near their transverse center line, wherein the weight of the material tending to force them open is counterbalanced in part by the weight of the material on the opposite side of the trunnion support. Full opening or closure of all of the doors on a two-hopper car can be made in about 1½ min.

From the bottom doors, ballast is spread over a width equal to the length of the ties, but is kept from

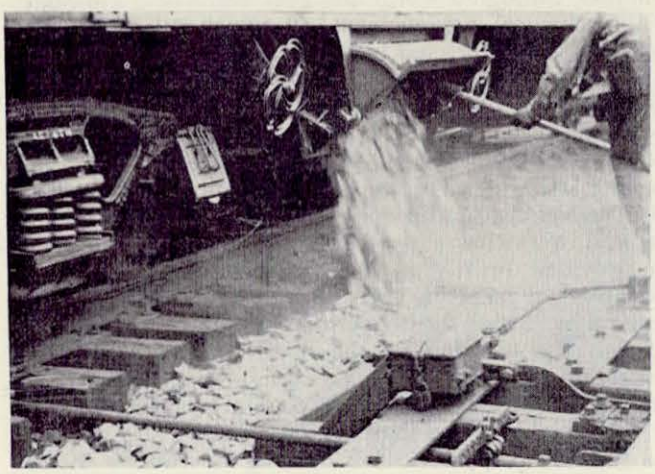


The Bottom Doors Are Fully Open—The Side Gate Is Closed

being deposited directly on the rails by means of deflectors of suitable shape, attached to the upper faces of the doors, directly over the lines of rails. The ballast is distributed quite uniformly on each side of the rail, except directly through the center of the track, where the distribution is considerably lighter owing to the obstruction caused by the center sill of the car. This is offset to some extent by the shape of the deflectors provided to keep the rails clear, which direct the ballast over a wider area between the rails than outside the rails.

The side gates provided in the new design, which are essentially for unloading ballast on to the track shoulders, consist in each case of a cylindrical cast-steel segment pivoted at each end. These gates, when in normal position, close off openings in the sides of the hoppers, directly alongside the bottom doors. The gate segment itself, which is provided with a tongue and groove on each side to prevent the leakage of fine material, is so mounted that it stays in a closed position, of its own weight, entirely within the side clearance of the car body.

The gate is opened upward and outward, rotating about its end bearings, by means of any suitable bar. The end of the bar is simply inserted in either of two cored sockets provided on the ends of the gate casting, and the bar is used as a lever in opening or closing the gate. Through the curved face of the gate and the position of the sockets, one man on the bar can open and close the gate readily, even when under full load pressure. Through regulation of the side gates, the ballast is distributed over a width up to 24 in., from the ends of the ties out, and thereby replenishes the ballast on the shoulders only.



The Side Gate Permits Controlled Distribution of Ballast Outside the Ends of the Ties—It Is Equally Adapted to Controlled Unloading of Coal on the Ground, Without Blocking the Track

With the door and gate controls close together directly along the side of the car, one man can distribute the ballast over the width of the track proper and on one shoulder at the same time. Where both shoulders are being ballasted simultaneously, an additional man is required to operate the gate on the opposite side of the car.

New England Distrustful of Percentage Rate Rise

CONSIDERABLE opposition to the proposed 15 per cent increase in freight rates was expressed by witnesses who testified at the Interstate Commerce Commission's hearings which opened in Portland, Me., on August 4. Several witnesses, however, favored some relief for the carriers but urged it be given in a flat increase in charges per car or per ton rather than on a percentage basis. An increase on this latter basis, it was feared, would disrupt the present competitive relationships and would penalize New England shippers to the advantage of their rivals.

Figures produced and explained by C. L. Whittemore, secretary of the New England Paper & Pulp Traffic Association, purported to show that there is danger of loss of the Chicago market for paper, other than newsprint, made by members of this Association. He quoted figures intended to show that one mill alone, the Oxford Paper mill in Rumford, would pay $291,968 in extra freight charges on finished products and raw materials including coal, if the 15 per cent increase is allowed.

W. H. Chandler, representing the Merchants' Association of New York, urged adoption of an arbitrary increase per ton, based upon the probable needs of the railroads in additional revenues and the best available figures on tonnage handled in 1930. This increase he would have graded so that the present class relationships might be maintained as well as the relationship between competing communities. An increase of not over 10 cents per hundred pounds on first class would accomplish this purpose, he said.

Would Base Increase on Needs of Rail Groups

Representing the Boston Chamber of Commerce, the New England Traffic League and the New Bedford Board of Commerce, William H. Day of Boston, opposed the percentage increase, which he said would be disruptive of competitive relationships. He said that figures indicate that the financial needs of the railroads serving the Eastern District are not as great as those of other portions of the country and that he believes the increase should be based upon the particular needs of each group. He admitted that the organizations he represents are assured that the rail carriers are confronted with a financial emergency and that temporary measures of relief are necessary.

Charles H. Jones, president of the Commonwealth Shoe and Leather Co., representing the New England Shoe & Leather Association, said that the market for the association's products has narrowed down since 1912 to the New York district. Percentage increases in rates tend to narrow the limit of the market he said, and a 15 per cent increase would further narrow their market and would prove almost destructive. George R. Nuzum, speaking for the Cotton Textile Manufacturers of Fall

River, said that the increase, coupled with new rate rulings shortly to go into effect would place New England textile manufacturers at a disadvantage of 82 cents per hundred pounds of finished goods when compared with Atlanta, Ga., in reaching the Chicago market. Gerry Burns of the United Drug Co., protested against the percentage increase but admitted that his company could stand the flat rate increase which would also apply to competitors.

Harry A. Davis, manager of the transportation department of the Boston Wool Trade Association, was absolutely opposed to any increase upon wool, declaring that the industry now is paying unreasonable rates on wool in the grease and that the wool industry today is in a very depressed state. L. B. Townsend, secretary of the New England Grain Dealers Association, was also opposed to any increase in rates on grain and feed, pointing out that they must be paid by the farmer and that a 15 per cent increase would mean $2,500,000 more out of the pockets of the agriculturists of New England, a sum which they can not bear with conditions as they now are. He made a tentative suggestion under examination that railroad labor might be asked to take a furlough or a direct wage cut along with those effective in other industries and in agriculture.

Stewart B. Copeland of the Eastern Manufacturing Co., Brewer, Me., and W. A. Duryea of the Penobscot Chemical Fibre Co., Great Works, Me., spoke of the hard sledding which has been experienced by the paper and pulp industry and substantiated testimony offered by Mr. Whittemore. F. M. Ives, of Boston, who conducted the testimony for the paper mills, and also represented the National Association of Cotton Manufacturers, merely entered the protest of the later group against the proposed increase.

Transportation of fish and fish products would be driven to motor trucks if the increase were allowed to apply to that industry Edward H. Cooley, speaking for the Massachusetts fisheries industry, declared. Once such a change had been made, he said, he felt it improbable that the railroads could ever get it back. This particular type of shipment is an attractive one for carriers, he said. He urged an exception on sea foods if an increase is allowed, as the fisheries industry is in poor financial condition and an increase would, in his opinion, react neither to the benefit of the fish industry or the railroads.

Maine Savings Banks Favor Increase

Henry M. Nelson of Portland, speaking for the Savings Bank Association of Maine, favored the 15 per cent increase, pointing out that 225,000 depositors of the state are vitally interested in the welfare of railroad bonds. He declared that many bonds must be struck from the list if they fail to produce earnings required by law for savings bank investment, and that liquidation of rail bonds might play havoc with the bond market.

Howard Davies, Portland attorney, "representing no one but himself," had a slight verbal tilt with Commissioner Porter as to the necessity for being sworn, but was finally sworn and delivered a brief oration to the effect that the railroads should receive aid because of the fact that they were in the position of an industry exposed to competition with the federal government, the latter using taxes paid by the railroads for inland waterways and federal-aid roads. Charles F. Flagg, director of the Maine Electric Co. of Portland, urged an advance as a necessity for the railroads, claiming that "it is an economic fallacy to treat a railroad as if it were a factory" and that it would be a calamity if the shippers should succeed in influencing the I.C.C. to deny the increase.

In several instances witnesses asserted that the 15 per cent increase would cause a reduction in the volume of freight carried by the railroads and bring an actual reduction in revenues. Andrew P. Lane, traffic manager of the Great Northern Paper Co., representing the St. Croix Paper Co., the Pejepscot Paper Co., and the Chambers of Commerce of Milo and Millinocket, said that the company, the largest producer of paper in the United States, would be forced to resort to water-borne pulp wood, probably would turn to oil in place of 160,000 tons of coal now used, and might ship the finished product by water in conjunction with motor truck transportation.

If the company is forced to handle its pulp wood by water it would mean loss of this traffic to the railroads for a period of four or five years at least, as it would necessitate the resumption of woods operations, which must be planned over a period of several years. He declared that the New England railroads themselves would be obliged to pay an additional $1,500,000 to other lines for transportation of fuel coal for the New England roads. He added that the increase would mean the ruin of a large percentage of paper manufacturers of the United States, who are finding it almost impossible to meet the competition of Canadian mills. This in turn would mean additional unemployment in Maine where the paper industry is a big one, and would react upon the carriers from many angles.

Holds Carriers Have Not Met Competition

Robert P. Hazzard, shoe manufacturer, representing the shoe industry of Maine, coupled his argument to the effect that shoe shipments would move by truck in the event of an increase, with a denunciation of the efficiency of the carriers, who he said "have not met competition." The increase he said is, "unfair because it passes a burden that should be up to the railroads to solve, onto an industry which has its own problems of fully as serious a nature with no government activity to arbitrarily pass it on for them to some other 'goat.'"

Aroostook county potato growers, who ship nearly one-fourth of the potatoes of the country will be driven to water freight to reach their markets, according to J. C. Briggs of Caribou, president of the Maine Potato Shippers & Growers Association. The increase would cost them $2,000,000 on outward bound freight and $1,000,000 on incoming freight he said. For the past four years they have averaged a loss of nearly four cents a bushel, he declared. Probably 50 per cent of the potato tonnage now handled by the Bangor & Aroostook would turn to rail and water transportation, he believes. Potatoes are concentrated tonnage, Mr. Briggs said, and should be handled cheaply by the railroads, but in the past 20 years rates have doubled, although the volume given to the carriers has also doubled. O. W. Tong, Minneapolis, Minn., appearing for the Maine growers and shippers, George P. Findlen, Fort Fairfield potato farmer, and W. Ray Thompson, potato farmer of Caribou, testified along similar lines.

Speaking for the Associated Industries of Maine, the Maine Traffic Association, the Maine Agricultural Department and the Sardine Canners Association, Benjamin F. Cleaves, former member of the Maine Public Utilities Commission and now secretary of the Associated Industries, told of finding almost universal opposition in the state to the 15 per cent increase, which would produce mal-adjustment of existing rates. He

expressed doubt that the increase would accomplish the purpose for which it was proposed as it would tend to shorten the radius of the circle of distribution thus reducing the volume of business offered the railroads. Under protest by railroad counsel he introduced figures to show that the two Maine railroads in 1928, 1929 and 1930 had showed earnings on their book valuation of from five to 8.3 per cent.

W. K. Sanderson, former general freight agent of the Maine Central, expressed the belief that, as the railroads as a group had asked for relief, the commission should deny such aid if it determined that any road had not complied with the stipulated conditions for fixing just and reasonable rates, and that the carriers individually should then be directed to seek aid. A. H. Erlanson, traffic manager of the Sanford Mills, appearing also for the Goodall Worsted Co., protested against an increase which he said cannot be passed along to the consumer under present conditions. Claude H. Swain of Concord, N. H., speaking for the shippers of Concord, advocated a flat charge to be assessed at loading and unloading points upon carload freight, the proceeds to accrue to the originating and terminating carrier. This would not effect l.c.l. shipments and would not drive such traffic to truck lines.

Arthur E. Pearson, Boston, representing the Hollingsworth and Whitney Co., pulp and paper manufacturers and Ralph D. Redfern of the Biddeford Chamber of Commerce protested any increase. Norris W. Ford, speaking for the Manufacturers Association of Conn., Inc., said that manufacturers of that state are convinced in their own minds that freight rates are now too high and that they are detrimental to industrial recovery. The increase would tend to concentrate the manufacture of non-ferrous metal products in large plants west of the Hudson because of the freight hauls necessary between certain manufacturing operations, and this would cost Connecticut much business and the New England railroads, the freight the Connecticut plants would pay.

W. F. Price of Glastonbury, Conn., explained that a percentage basis of freight increase would bring the "freight walls" nearer to New England and would thus cut down the territory in which New England manufacturers might operate.

Books and Letters . . .

Proceedings of the American Wood-Preservers' Association, 500 pages. 6in. by 8½ in. Bound in Cloth. Published by the Association, 1427 I street, N. W., Washington, D. C.

Like reports of preceding conventions of this association, this volume, which covers the convention held at Philadelphia, Pa., on January 27-29, contains reports of standing committees, personal papers and addresses relating to the technical phases of wood preservation and records of service life of treated wood subjected to various uses. Of particular interest to railway men, aside from service records of ties, poles, posts, etc., and more technical material, are reports on bridge and structural timber and on the treatment of car lumber, as well as papers on the use of treated timber on the Lehigh Valley and the Atchison, Topeka & Santa Fe.

L.C.L. Rates Need Revamping

ALTON, ILL.

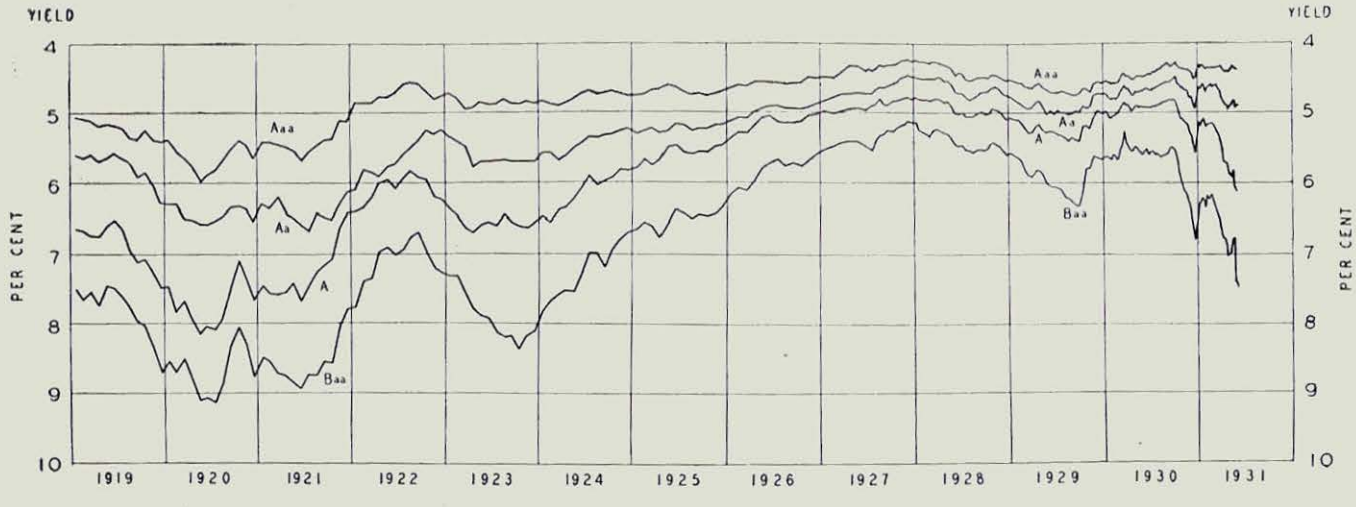
TO THE EDITOR:

An l.c.l. freight bill before me reads 4,225 lbs. at 29½c $12.46. This is a 25-mile haul and any truck could move empty to the city in one hour, pick up at warehouse in half hour, return in one hour and effect delivery to consignee in half hour. A 3-ton truck can certainly be operated at a profit, for less than $25 per day. The railroad rate of course does not include pick up or store-door delivery. Railroads cannot expect to hold business under such competition. This would indicate that they have failed to recognize the new element that has entered into rate making field—competition—and are continuing to base rates on a monopoly theory.

The above case shows conclusively that short-haul l.c.l. rates are seriously in need of revamping or cancellation. It may not be necessary to place these rates on a carload basis, but it would seem that an arbitrary rate per 100 lb. between minimum shipments and carload lots must be revised, possibly, on a sliding scale with 500 lb. or less breaking points. When the fact is considered that 5 men, 1 engine and 100 cars can move 3,000 tons of freight which would require 300 men, and 300 trucks, the fault seems to lie with the rate base. While it is true, free roadway for trucks favors them unfairly, nevertheless, we have the competition to face and unless we meet it, we should close our l.c.l. facilities.

RAILROADER.

* * * *



Railroad Bonds in Two Depression Periods

A chart prepared by Moody's Investors Service showing relative market prices of four classes of railroad bonds in the order of their relative security in the depressions of 1921 and 1931. The relative stability of the highest rated bonds as compared with the lower grade is clearly shown, the latter following more nearly the trend of the stock prices.

Odds and Ends . . .

Hello, World

Miss Elsie Gardner, New York Central telephone operator at Albany, N. Y., recently chosen "Miss Columbia" in a popularity contest, was presented with a trip around the world as the prize.

Perpetuating His Memory

In the presence of practically the entire citizenry of Horton, Kan., a large boulder monument was recently dedicated to the late C. H. Schneider, former district storekeeper of the Chicago, Rock Island & Pacific at that point.

An Air-Cooled Prescription

The first prescription of its kind on record was issued by a Washington (D.C.) physician when he recommended to a woman patient who had been overcome by the heat at the capital that she return to her home at Plainfield, N. J., only on an air-conditioned, air-cooled train.

In the Field of Education

Among the unusual combinations of activities participated in by railroad men are those of Conductor W. P. Nims and Engineman E. C. Slade of the Chicago, Rock Island & Pacific who were recently re-elected president and secretary, respectively, of the Board of Education of Limon, Colo., for their third term.

Home-made Airplane

What is probably the first airplane to be constructed of spare parts, at least by a railway employee, has been completed by C. T. Burnette, car inspector for the Missouri-Kansas-Texas at Franklin, Mo. The plane recently made its first flight at Booneville, Mo.

Twenty Years Lost

"Cast bread upon the waters and it shall be returned through a railroad lost and found bureau" might be a justifiable paraphrase of the biblical admonition. Recently the Pennsylvania lost-and-found bureau at Philadelphia, Pa., returned a brief case which was picked up by a trainman on a Paoli local train and had been lost by a Haverford man 20 years ago.

Something New in a Bird House

When railroaders, and particularly those of the mechanical forces, lay aside their tools at the end of the day one has a feeling that it is only until they can pick them up a short time later in their home workshop. And usually what they produce smacks in some way of the railroad. John L. Vana, a machinist at the Omaha shops of the Union Pacific, has a Martin house on a pole in his back yard that is as perfect a miniature, as a Martin house could be, of the new Union station at Omaha.

Another Hobby for Railroad Men

If collecting railroad pictures is one of your hobbies, you may be interested to know that the International Engine Picture Club, sponsored by the Railroad Man's Magazine, offers convenient facilities for the purchase, sale and exchange of such pictures. This club has several thousand members who are to be found in all parts of the world. Its membership is free and is not limited to readers of the magazine. Furthermore, there is no initiation fee, and there are no dues. Each member is entitled to have his name and address published in the magazine, without cost, together with information on the material he wishes to collect, buy, sell, exchange, paint or draw. Among the members is Charles E. Fisher, president of the Railway and Locomotive Historical Society, Inc., who regards the club as of value in encouraging railway photography and preserving for prosperity rare old pictures which might otherwise be lost.

If you happen to collect locomotive pictures, you should know that the champion of them all, Joseph Lavelle, of Long Island, N. Y., has more than 30,000 photographs of North American locomotives. There is a mark to shoot at.

Quick Boy! My Magic Carpet

A weary traveler pulled up to the Pennsylvania station at East Pittsburgh, Pa., recently, in a small car. James E. Harris, janitor, was polite to him and escorted the man to the ticket window. He said he was driving from New York to Chicago and as train after train shot by him he began to compare the comfort of the autoist on a hot day with those in the fast-flying steel cars, and stopped to inquire the fare to Chicago. He left $17.33 with S. W. Caldwell, ticket agent, gave the car to Janitor Harris, took his ticket and boarded a train for Chicago. —Pennsylvania News.

Borders and Boarders

Passengers on Michigan Central trains between Chicago and New York are accustomed to seeing the club-car attendant padlock his supply of cigars, cigarettes and other items commonly on sale, when the trains cross the international border and enter Canada for their run across the lower part of Ontario. Upon re-entering the United States, the padlocks are opened and business is resumed at the old stand. They have a somewhat different situation, however, on a train operating between Berchtesgaden, in Germany, and Salzburg, which lies in Austria. The train carries a car in which cold food is served, and the question of customs control at the border presented some difficulties. The problem was solved by the installation of two cupboards in the car. Austrian food is purveyed from Cupboard A, which is sealed when the international border is crossed and the train enters Germany. Cupboard B contains food purchased in Germany, which is served to passengers while the train is on the German side of the line.

The Second Bridge Over the Missouri River

In 1868 the Union Pacific began the construction at Omaha, Neb., of the first bridge over the Missouri river. Because of financial difficulties, this single-track bridge lost the right to be known as the first bridge over the Missouri, and when it was finally opened on March 14, 1872, its completion had been preceded by that of a bridge at Kansas City. The bridge, which had trusses of the "Post's Patent Diagonal Truss" type, is shown in the accompanying illustration. There were 11 spans, each 250 ft. in length, 60 ft. above high-water level. The west

First Union Pacific Bridge at Omaha

approach consisted of a trestle 60 ft. high and 729 ft. long, while the eastern approach was a graded fill 2.5 miles in length. A cyclone wrecked the eastern end of the bridge in 1877. It was repaired and used until 1886 when it was rebuilt. Gen. Grenville M. Dodge, chief engineer of the Union Pacific, selected the site of the structure, which is now occupied by the present Union Pacific bridge, at Omaha, after a conference with Abraham Lincoln in 1863.

NEWS

Fair Deal for Railways Urged by Congressman

Representative McFadden stresses need for early removal of restrictive laws

Declaring that railroads should logically develop into general carriers, "meeting every need of transportation," Representative L. T. McFadden of Pennsylvania, chairman of the House of Representatives' committee on banking and currency discussed, in a recent address, the means whereby such a situation could be brought about. The speech was delivered July 20, in Savannah, Ga., at a dinner in honor of Henry D. Pollard and E. R. Richardson who recently were elected respectively president of the Central of Georgia and president of its subsidiary, the Ocean Steamship Company.

Congressman McFadden opened his remarks with an outline of the importance of the railways to everyone in the country and declared that "the adoption of fair policies of government toward the railroads, the assurance to them of equality of opportunity with all other forms of enterprise and willingness on the par of their patrons (particularly the great industrial leaders of the country) to deal with them on the principle of "live and let live," therefore become matters of personal moment and concern to substantially every human being living in the United States."

Continuing, the speaker discussed the buying power of the railways and the effect of its impairment on business conditions. He next referred to the burden of taxation which amounts to a drain upon net earnings "greater than any industry might reasonably be expected to withstand and especially one so rigidly regulated and restricted as the railroads." From a mention of the failure of railroads to earn a fair return during the past decade, Congressman McFadden led up to a consideration of the pending petition for increased rates. This latter, he thought, should be regarded as an "emergency revenue measure and not a rate measure."

With regard to other forms of transportation, Mr. McFadden advocated equitable treatment for railways with respect to such competition. Legislation, he contended, should be enacted to enable the railways to enter the shipping business on the Great Lakes, the inland waterways and through the Panama Canal.

"One of the most objectionable features in the entire inland waterways situation, he continued "is the operation by the Government, through the Inland Waterways Corporation, of an important line of barges upon the Mississippi and Warrior rivers at rates so low as to constitute subsidies to the industries using them. Moreover, the railroads are compelled to make joint through rates with these barges, thus short-hauling their own traffic and cutting their revenues.

"It has been estimated by competent authority that the rates charged shippers on these government barge lines barely cover the out-of-pocket costs of operation without any allowance for the enormous capital investment in the river systems, or for maintenance of channels, locks, dams, etc. According to these estimates, the rates cover less than half the actual costs, if all the elements of capital investment are taken into consideration. The taxpayers of course make up the difference. It is of course needless to say that the government barge line, itself, pays no taxes.

"By the terms of what is known as the Denison Act, the War Department is directed to sell the Government barge line, if practicable, to a private purchaser, with the restriction that no railroad shall have any interest or participation therein.

"Under these conditions no buyer has thus far appeared. It seems obvious that this restriction is an artificial and unjust one and should be eliminated in order to permit the railroads to consider whether, by co-ordinating the barge lines with their own services, it would be possible to put the barge operations upon a sound economic paying basis.

"One of the great injustices done to the railroads has been to bar them from the use of the Panama Canal, since the date

(*Continued on page 226*)

Aluminum Pullman Cars Being Developed

The Pullman Company is experimenting with the application of aluminum to sleeping cars and plans to construct an all-aluminum sleeping car within a year. According to present plans, the entire car, with the exception of the wheels, axles and springs, will be made of aluminum, and as a result, the weight of the car and the cost of moving will be reduced materially, as compared with present conditions and practice. The interior arrangement of the new car will differ from that of the standard Pullman sleeping car.

Earnings for Half Year Average 2.15 Per Cent

Return of Class I roads compares with 1930 net amounting to 3.46 per cent

Class I railroads of the United States for the first six months of 1931 had a net railway operating income of $238,550,-140, which was at the annual rate of return of 2.15 per cent on their property investment, according to the Bureau of Railway Economics. In the first six months of 1930 the net was $377,379,211 or 3.46 per cent on their property investment.

Gross operating revenues for the first six months of 1931 totaled $2,187,437,435, compared with $2,692,255,942 for the same period in 1930, or a decrease of 18.8 per cent; operating expenses amounted to $1,716,774,190, compared with $2,073,948,-402, a decrease of 17.2 per cent.

Class I railroads in the first six months of 1931 paid $164,738,625 in taxes, compared with $180,298,591 for the same period in 1930, a decrease of 8.6 per cent. For June alone, the tax bill amounted to $27,492,263, a decrease of $3,611,468 under June the previous year.

Forty-one Class I railroads operated at a loss in the first six months of 1931, of which 13 were in the Eastern, six in the Southern and 22 in the Western district.

For June alone the net railway operating income was $50,162,553, which, for that month, was at the annual rate of return of 2.33 per cent. In June, 1930, the net was $69,162,585 or 3.27 per cent. Gross operating revenues in June amounted to $369,810,398, compared with $444,951,454 in June, 1930, a decrease of 169 per cent. Operating expenses totaled $280,145,367 compared with $334,721,480 in the same month in 1930, a decrease of 16.3 per cent.

Class I railroads in the Eastern district for the first six months in 1931 had a net of $136,371,717, which was at the annual rate of return of 2.44 per cent. For the same period in 1930, their net was $220,-553,050, or 4.06 per cent on their property investment. Gross operating revenues in the Eastern district for the first six months in 1931 totaled $1,102,666,479 a decrease of 19.3 per cent below the corresponding period the year before, while operating expenses totaled $850,161,985, a decrease of seventeen per cent under the same period in 1930. In the Eastern district for June the net was $26,734,750, compared with $39,026,621 in June, 1930.

The net in the Southern district for the first six months of 1931 was $25,497,912, which was at the annual rate of return of 1.55 per cent. For the same period in

1930, the net amounted to $43,189,455, or an annual rate of return of 2.64 per cent. Gross operating revenues in this district for the first six months in 1931 amounted to $282,648,812, a decrease of 17.6 per cent under the same period in 1930, while operating expenses totaled $228,490,179, a decrease of 15.8 per cent. For June the net was $3,206,851, compared with $4,113,834 in June, 1930.

Class I roads in the Western district for the first six months in 1931 had a net of $76,680,511, which was at the annual rate of return of 1.98 per cent. For the same six months in 1930, the railroads in that district had a net of $113,636,706, which was at the annual rate of return of 2.97 per cent. Gross operating revenues in the Western district for the first six months this year amounted to $802,122,144, a decrease of 18.4 per cent under the same period in 1930, while operating expenses totaled $632,122,026, a decrease of 18.1 per cent. For June alone, the net in the Western district amounted to $20,220,952. The net of the same roads in June 1930 totaled $26,022,130.

CLASS I RAILROADS—UNITED STATES

	Month of June 1931	1930
Total operating revenues	$369,810,398	$444,951,454
Total operating expenses	280,145,367	334,721,480
Taxes	27,492,263	31,103,731
Net railway operating income	50,162,553	69,162,585
Operating ratio—per cent	75.75	75.23
Rate of return on property investm't	2.33%	3.27%
	Six Months Ended June 30	
Total operating revenues	$2,187,437,435	$2,692,255,942
Total operating expenses	1,716,774,190	2,073,948,402
Taxes	164,738,625	180,298,591
Net railway operating income	238,550,140	377,379,211
Operating ratio—per cent	78.48	77.03
Rate of return on property investm't	2.15%	3.46%

Correction

In the table of operating statistics published in the *Railway Age* of July 25, page 147, the figure for pounds of coal per thousand gross ton-miles for the Texas & Pacific was in error. The figure shown was 93 lbs., whereas it should have read 83 lbs.

S. P. Advertising Wins Contest

The Southern Pacific advertising exhibit entered in the annual advertising contest conducted by the Pacific Coast Advertising Clubs' Association was awarded first place at the recent convention of the association. First place was also awarded the Southern Pacific advertising last year.

Illinois Central Safety Flags

The Illinois Central, since August 1, has been using "safety flags" at 145 points on its lines to designate the daily progress of accident prevention. The flags are white with a green circle in the center, and within that circle, a white cross. Each flag will be displayed on every day when no fatal or disabling accident has occurred to any employee at that place during the 24-hour period ending at 6 p. m. of the previous day.

The ranking officer on the ground will be in charge of the safety flag. He will keep a record of the days that the flag is displayed and the days not displayed. Since the flag is on display only when there has been no injury requiring absence from work, the requirements are more stringent than those of the Interstate Commerce Commission which counts only such accidents as compel three days' absence.

Movies Help First Aid

A. O. Beck, chief first aid organizer of the Canadian National plans to use motion pictures to instruct employees of that road in first aid. A reel illustrating artificial respiration is being prepared for use in the Central region, and copies of the same will be provided also for the western coast lines and for those in the Maritime Provinces.

Standard Crate for Monuments

Preparations of monuments, tombstones and markers for shipment is the title of Bulletin No. 24, which has been issued by the Freight Container Bureau (A. R. A.) 30 Vesey street, New York City; a 16-page pamphlet profusely illustrated with drawings explaining in detail the construction of crates for all shapes and sizes of stone monuments offered for transportation.

N. & W. Veterans

The second annual meeting of the Colored division of the Norfolk and Western Veterans Association, will be held on September 12, at the Bay Shore Hotel, Buckroe Beach, Va. Approximately 200 "old timers" of the railroad from every part of the system are expected to attend.

The Colored division of the association has 223 members, 130 are active employees, and 93 retired.

C. & N. W. Agents Sell Bus Tickets

Motor bus tickets of Chicago & North Western Stages, subsidiary of the Chicago & North Western, are now being sold by the railway's ticket agents, and railroad tickets, covering transportation between points where both rail and bus service is offered, are being honored on either trains or buses. The Chicago & North Western Stages operates over 3,000 miles of routes in North Western territory, paralleling several of the principal railway lines.

C. & I. M. Proposes Peoria-St. Louis Line

The Chicago & Illinois Midland has applied to the Interstate Commerce Commission for authority to lease the St. Louis, Jerseyville & Springfield, and to operate over certain portions of the Alton & Eastern and the Illinois Central, and thus create a new line between Peoria Ill., and St. Louis, Mo. The St. Louis, Jerseyville & Springfield has asked permission to acquire and operate the Chicago, Springfield & St. Louis from Springfield to Lock Haven. This line at one time was part of the Chicago, Peoria & St. Louis.

Under the plan as submitted to the commission, it is proposed to operate over the Alton & Eastern from Lock Haven to Granite City, and for a short distance over the Illinois Central tracks in Springfield, thus making a connection between the eastern and western parts of the proposed line.

Questionnaire in Ex Parte 104

The Interstate Commerce Commission plans to issue questionnaires to the railroads in gathering information in its investigation concerning the efficiency with which the railroads are operated. It is considered likely that a considerable part of this questionnaire will be devoted to questions regarding prices paid for railroad fuel, private freight cars, practices in switching cars to industries, and construction and maintenance practices for industrial sidings.

I. C. Bus Service

Through a subsidiary, the Central Transportation Company of Illinois, the Illinois Central has inaugurated bus service between Kankakee, Ill., Matteson and 211th street, Chicago. The bus schedules connect with those of the electric suburban trains operated between Chicago and Matteson. The 29-passenger motor coach which has been purchased for this service will make four round trips daily over the route. Both railroad and bus tickets will be honored either on trains or on the motor coach.

Heat Reduces Grape Crop

Shipments of grapes from California this year will be about 15 per cent less than last year owing to the hot weather experienced in California during July. Shipments this year will not exceed 60,000 carloads, as compared with 65,000 carloads actually moved last year. The tonnage this year is estimated at 1,742,000, as compared with 2,182,000 last year and 2,155,000 for a five-year average. The heavy movement is expected to start on September 10 this year, as compared with September 20 in previous years.

"Sam Browne" Belts on Crossing Watchmen

The Chicago & North Western, in its effort to reduce highway crossing accidents, has equipped crossing watchmen with red and white "Sam Browne" belts so that the contrast between the colors of the belts and the clothing of the watchmen will warn approaching motorists some distance away. The belts will be tried first at crossings on the Wisconsin division between Chicago and Milwaukee, Wis., where traffic is intense, and the general use will be extended as fast as possible to other points where heavy crossing traffic warrants it.

Motor Transport Investigation in South Carolina

The Governor of South Carolina has recently signed a bill providing for the appointment of a commission to investigate motor transportation in that state and report to the next session of the legis-

lature. The act provides that the commission shall inquire thoroughly into the question of motor transportation of passenger and freight in South Carolina, and appropriates $5,000 for the expenses of the inquiry. The commission is to be composed of two members from the State Highway Board, two from the Railroad Commission and one from the Tax Commission.

Chicago L.C.L. Delivery Makes New Record

Railroads operating out of Chicago established a new high record for on-time l.c.l. freight delivery during June, when 97.94 per cent of the shipments out of Chicago arrived at destination on schedule. The previous record of 97.68 per cent was set in May of this year. Of 52,217 cars moved during June, 51,140 or 97.94 per cent, were on time. The mark for June of 1930 was 95.90 per cent. Cars one day late totaled 872, or 1.67 per cent. The figure for June, 1930, was 3.26 per cent. Only 205 cars, or 0.39 per cent, were reported more than one day late, while in June of 1930, the number was 454 or 0.84 per cent.

Manual of Street Traffic Signs

A. W. Koehler, secretary of the National Conference on Street and Highway Safety, Department of Commerce, Washington, announces the completion of the Manual on Street Traffic Signs, Signals and Markings, and the Model Municipal Traffic Ordinance, following the adjournment of state legislatures, giving assurance that the standards now embodied in these publications of the National Conference will not be disturbed in the immediate future. The Model Municipal Traffic Ordinance has been adopted by numerous cities and towns throughout the country; and the standards shown in the manual on street traffic signs are already in effect in a large number of places. These publications cover details not dealt with specifically in state laws.

Illinois Central Telegraphers' Wages

The closing arguments in an arbitration proceeding on a request for 16⅔ per cent increase in the hourly rates of pay of telegraph employees of the Illinois Central, were presented at Chicago on August 1. The arbitration is the outgrowth of negotiations which were begun by the telegraphers in June, 1929, for the establishment of a six-day work week, vacations with pay, certain changes in working rules and a wage increase.

Proposals for vacations with pay and further changes in working rules were withdrawn, and an agreement to submit the application for a wage increase to arbitration was reached early last year.

The plea for increased rates of pay means that telegraphers placed on a six-day week, want the same aggregate pay which they formerly received for working seven days. The arbitrators are E. J. Manion, president, and F. F. Cowley, vice-president of the Order of Railroad Telegraphers; E. C. Craig, general solicitor, and T. J. Quigley, general superintendent of the Illinois Central; Dr. Davis R. Dewey, professor of economics of the Massachusetts Institute of Technology; and Judge Hugo O. Hanft of the District court, Minneapolis, Minn.

Special Carload Rates on Illinois Terminal

The Illinois Terminal Railroad has issued a freight tariff, effective July 27, which provides for commodity carload rates on merchandise of fourth class, or higher, and which applies on minima of 5, 10 or 15 tons per car. There is also a provision that a car may be stopped at intermediate points for unloading at $5 a car.

This company has also provided co-ordinated service with transfer companies which is open to all shippers and has put on express passenger cars, between St. Louis, Mo., and Venice, Ill., Madison and Granite City. Under this new arrangement, five express cars will leave Granite City for St. Louis between 6:00 a. m. and 6:45 a. m., and four between 4:15 and 5:15 p. m. Six express cars will depart from St. Louis for Granite City between 6:45 a. m. and 7:24 a. m., and five between 4:45 p. m. and 5:45 p. m.

"Neutral Zone" Through Maine If St. Lawrence Is Deepened

That the United States should be asked to allow a "neutral zone" across the state of Maine along the line of the Canadian Pacific in return for similar privileges which Canada would accord American shipping passing through the St. Lawrence river, in the event of the development of the St. Lawrence deep waterway, was advocated in the Canadian Senate in Ottawa last week by Senator W. E. Foster. The Senator stated that the crossing of two international borders in reaching St. John, N. B., from Montreal was a great inconvenience for both freight and passengers. The St. Lawrence waterway, he continued, would probably be deepened through international cooperation, which would call for the unmolested passage of American shipping through that portion of the waterway lying wholly within the confines of Canada. If this provision should be made in favor of U. S. water traffic in Canada he thought that it was equally important that a similar "neutral zone" should be provided for Canadian rail traffic through the State of Maine, to give ready access to the Port of St. John.

Limitation of Vehicle Sizes Upheld in Idaho

The Supreme court of Idaho in a recent decision upheld the Public Utilities Commission of that State in its efforts to regulate the size of motor vehicles operating in the capacity of public carriers.

The commission, following a hearing on Dec. 29, 1930, limited the size of common carrier vehicles operating on United States highway No. 10, between Kellogg and Coeur d'Alene, to 25 feet in length and 7½ feet in width, the order becoming effective Feb. 16, 1931. The truck lines petitioned for rehearing, which the Commission denied.

The truck lines then carried their appeal to the Supreme court, contending that the order was issued on insufficient evidence, that it was arbitrary and unreasonable, that it discriminated in favor of private and contract operators and that it was a police regulation inconsistent with the authority and power of the Commission.

The Supreme court held that evidence showing the highway to be narrow, winding and full of "blind curves" was sufficient to cause the commission to limit the size of vehicles as a safety measure. The court stated that absence of serious accidents was due to "unusual skill and carefulness" of the drivers rather than to lack of danger resulting from extra large vehicles operating over the route.

C. P. R. in June

Net operating revenues of the Canadian Pacific in June were $2,186,421, a reduction of $594,902 from the like month of 1930. Gross revenues for the month showed a reduction of $3,422,546, standing at $12,439,959, while operating expenses were reduced by $2,827,644 to $10,253,538, leaving net at $2,186,421, as noted, which compared with $2,781,323 in 1930.

For the six months ended with June gross revenues were $70,505,218, a reduction of $14,570,596 from the $85,075,814 reported for the like period of 1930. Expenses were cut $13,14,786 to $62,367,-099, leaving the net for the six months at $8,138,118, a reduction of $1,422,810 from the corresponding period of last year.

The following statement shows gross revenues, expenses and net for the month of June, and for the six months of the fiscal year ended with June, with comparisons:

JUNE

	1931	1930	Decr.
Gross	$12,439,959	$15,862,505	$3,422,546
Expenses	10,253,538	13,081,182	2,827,644
Net	$ 2,186,421	$ 2,781,323	$ 594,902

SIX MONTHS

	1931	1930	Decr.
Gross	$70,505,218	$85,075,814	$14,570,596
Expense	62,367,099	75,514,885	13,147,786
Net	$ 8,138,118	$ 9,560,920	$ 1,422,810

C. N. R. Employees Take Half-Day Off

Following an agreement reached between the management of the Canadian National and representatives of the railway employees, it was announced in Montreal last week that effective August 1, officers and employees of the Canadian National receiving less than $4,000 per annum will be off duty one half day per week without pay, and payroll deduction will be made accordingly. This information is contained in an official letter to heads of departments, signed by Sir Henry Thornton, chairman and president of the railway.

The arrangement covers clerical and other forces who are working under union agreements with the company and non-scheduled employees as well. Officers receiving more than $4,000 per year have taken a salary reduction of ten per cent

announcement to that effect having already been made.

So far as practicable, the president's letter states, the half-day period off duty will take place on Saturday morning. Where the Saturday morning is not feasible, employees will be relieved half of another working day.

The arrangement is designed to obviate the necessity of discharging a large number of employees and thereby adding to unemployment. The reductions in the payroll on account of the half-day lay-off per week will amount to eight and one-third per cent.

U. P. Employees Organize to Promote Business

Employees of the Union Pacific have instituted a campaign against unregulated forms of transportation, and, in a spirit of self-defense, are endeavoring to recover business lost to these competitors. This campaign, sponsored by an organization in the form of an employee-booster league, is designed to secure support from merchants and newspapers, which are assisting by publishing statements showing the distribution of salaries of employees and the benefits accruing to merchants as a result of employee expenditures.

The booster club, in addition to personal efforts, is employing advertising as a means of furthering its cause. Typical of this is an advertisement which appeared in a Denver, Colo., newspaper, and which reads as follows: "In Denver alone there are 1,997 Union Pacific employees. With their dependents they comprise a total population of 8,613 people. They are all well paid, they are thrifty; more than half the Union Pacific families own the homes they occupy. In 1930, they earned $3,650,000 in salaries and wages, which was spent in the markets of Denver.

"They are a very definite force working toward the permanence and solidity of the community.

"Their prosperity rises or falls with the prosperity of the Union Pacific. If the railroad is given the public support and patronage which it earns by its services to the community, it will prosper, and its employees with it. If other and unregulated forms of transportation are allowed to undermine the railroad, employment with the railroad is affected."

New C. N. R. Fruit Handling Facilities

Complete and up-to-date fruit handling facilities, constructed as part of the Montreal terminal project of the Canadian National were placed in service on August 3, when the new fruit warehouse on Trudel Avenue, west of Guy Street, Montreal, was opened for business. With the new facilities in operation, the reception, unloading, auctioning and distribution of some seventy carloads of perishable fruit and vegetables daily is possible.

Building and team track facilities combine all of the latest developments for the handling of perishable commodities, and before the plans for the new fruit warehouse were prepared a delegation representing the fruit trade of Montreal and architects of the Canadian National visited Cleveland, Ohio. Detroit, Mich., and Pittsburgh, Pa., to inspect similar facilities in those cities and to benefit by the experience of the fruit shippers there. In addition, climate conditions peculiar to Montreal were also given consideration in planning the new facilities.

The fruit warehouse, which stands on Trudel Avenue west of Guy Street bridge, consists of a three-story building, including storage basement, 638 ft. in length and 76 ft. wide. It is of reinforced concrete, fireproof construction, supported by pile, with team tracks on the outside of the building. The basement is equipped with fan ventilation to allow the proper storing of commodities such as apples, oranges and other fruit. Provision has been made for tomato ripening space, approximately 6,000 square feet having been leased to the trade for this purpose. The sales floor is laid out to allow the proper display of fruits and vegetables to prospective customers. On the second floor of the building are offices, auction rooms and cafeteria.

New York Central Moving Accounting Department

The Brotherhood of Railway Clerks, which has been protesting against the action of the New York Central in requiring large numbers of employees of its accounting department to move from one city to another, announces that the matter has been amicably settled. Conferences have been held at New York with J. G. Walber, vice-president of the road, and President Harrison of the clerks' association, and the general chairmen of the New York Central lines affected. As a result of the settlement the clerks' organization withdrew a dispute which had been filed with the Board of Mediation for changing the agreement dealing with consolidation of offices.

The accounting departments of the road, following the leasing by the New York Central of the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis, are being consolidated at New York, Cleveland, Detroit and Cincinnati. It is said that about 1,000 employees are affected, and that 350 to 400 clerks and their families will be required to move. The railroad company will defray the cost of moving. It is expected that probably 150 employees in the four cities will give up their jobs rather than move, thus automatically taking care of the reduction in forces which is made possible by the consolidation of offices.

Parliament Ends Session

Three speeches were all that was necessary to dispose of the financing bill of the Canadian National in the Senate at Ottawa last week. Senator W. B. Willoughby, Conservative leader in that chamber, moved its second and third readings. Approval was also given to the measure providing for government guarantee of the railways' securities.

Senator George P. Graham, former Minister of Railways, approved of this request for money coming in the form of a bill and not in an estimate, as formerly. He said the railway situation throughout the world at present was not inspiring, and Canada was no exception in this respect. Because earnings had dropped during the depression was no argument against railway management. The railways were not prosperous because no one was prosperous. The railway companies were not getting fair criticism as they were doing all that could be expected of them. In the United States there was an application for increased freight rates. In Canada there was less density of population than in the United States and when the long haul freight traffic dropped, Canadian railways were severely hit.

He pointed out there would be no advantage in turning some railways into highways and there would be a disadvantage to those communities that had grown up along the proposed railways to be dismantled. There should be the strictest economy commensurate with the maintenance of the standard of efficiency. The C. P. R. was the greatest transport system in the world and was well managed. The C. N. R. was the largest and was also well managed. It was more difficult to manage a Government system than a private system. Members of Parliament took a deeper interest in a Government system and they should do so, but they should not interfere in the management, nor should the Government, except to keep an eye on expenditure. Another difficulty which had confronted the National Railways was the harmonizing of the officials of the several companies. He did not know any man who could have done this so successfully as Sir Henry Thornton.

Senator Graham pointed out that many of the major obligations and heavy capital expenditure were inherited by the Canadian National Railways. The Toronto terminal had been ordered by the Railway Commission and when the Grand Trunk was taken over, this obligation was taken over also. The Montreal terminal had been ordered by the Railway Commission years before the Toronto terminal. This was also an inherited obligation by the Canadian National, which was only responsible for larger terminals made necessary by the increase in business since the first order of the Railway Commission.

He also pointed out the disastrous competition from automobiles and motor trucks and suggested that some portion of the gas tax should go to municipalities. There should be some equalization of taxation among municipalities, railways and other transportation competitors.

Senator Gideon Robertson, Minister of Labor, said both railways were well managed, particularly since capital expenditure on one of them had been curtailed. This expenditure had been a severe lesson to Canada. The purchasing power of western Canada had been greatly reduced and the Canadian National was unable to earn its normal revenue. Railway employees had suffered severely from the reduction in business. There was a limit, he said, to railway economies consistent with the maintenance of service and equip-

(Continued on page 226)

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income. 1930.
Akron, Canton & Youngstown	June	171	$148,806	$68	$157,018	$23,498	$17,823	$10,700	$48,381	$9,407	$109,809	69.9	$47,209	$33,879	$20,099	$37,057
	6 mos.	171	974,221	450	1,024,164	126,116	103,167	74,467	312,626	84,699	700,602	68.4	323,562	247,495	161,781	266,448
Alton & Southern	June	30	.....	.....	97,935	9,434	8,269	5,248	34,815	4,745	62,511	63.83	35,424	24,952	22,976	20,062
	6 mos.	30	.....	.....	550,832	57,911	41,399	30,679	205,303	28,151	363,443	65.98	187,389	131,283	122,963	133,213
Atchison, Topeka & Santa Fe	June	9,671	9,224,968	2,073,490	12,308,788	2,014,716	2,769,612	395,969	3,950,012	428,082	9,508,143	77.2	2,800,645	1,685,076	1,227,323	2,856,018
	6 mos.	9,656	54,044,421	11,416,992	72,451,628	11,143,410	17,059,552	2,437,612	24,444,068	2,626,431	57,621,695	79.5	14,829,933	8,582,441	8,568,772	10,830,339
Gulf, Colorado & Santa Fe	June	1,976	1,411,607	91,979	1,599,028	262,420	376,090	57,205	559,888	99,285	1,348,954	84.4	250,074	151,548	37,035	359,282
	6 mos.	1,976	7,264,871	528,922	8,392,444	1,632,829	2,148,350	347,425	3,238,581	495,937	7,843,223	93.5	549,221	—37,699	—699,895	—411,362
Panhandle & Santa Fe	June	1,877	818,652	60,137	943,608	140,507	237,881	20,768	309,140	33,737	739,671	78.4	203,937	149,847	39,240	407,224
	6 mos.	1,775	4,343,284	380,028	5,128,195	1,027,400	1,313,269	124,625	1,808,581	227,574	4,479,763	87.4	648,432	313,552	—315,682	—142,906
Atlanta & West Point	June	93	110,636	29,629	160,444	19,342	28,191	10,752	60,926	11,577	134,454	83.8	25,990	14,400	7,966	8,924
	6 mos.	93	654,331	180,014	974,177	129,233	187,728	63,464	400,380	70,437	873,168	89.6	101,009	31,064	—23,351	51,406
Western of Alabama	June	133	112,263	31,083	158,833	23,654	41,602	11,282	60,840	11,761	151,918	95.6	6,915	—3,825	—3,986	24,664
	6 mos.	133	724,714	191,613	1,028,500	155,337	241,051	67,426	378,974	72,700	935,175	90.9	93,325	22,103	58,233	178,894
Atlanta, Birmingham & Coast	June	639	215,823	10,484	255,970	68,731	75,748	27,052	131,847	18,882	332,862	130.0	—76,892	—93,268	—105,984	—80,744
	6 mos.	639	1,497,779	63,067	1,756,089	438,697	446,890	161,801	849,102	116,991	2,071,502	118.0	—315,415	—411,779	—527,022	—412,315
Atlantic Coast Line	June	5,162	3,790,878	424,771	4,573,258	710,515	918,720	145,534	1,662,701	170,178	3,624,140	79.2	949,118	548,691	310,026	20,038
	6 mos.	5,162	25,902,710	5,393,894	34,372,358	4,345,085	5,769,601	905,475	11,308,329	1,054,430	23,713,434	69.0	10,658,924	7,506,703	6,044,370	5,761,211
Charleston & Western Carolina	June	342	243,663	5,182	255,237	39,613	22,381	7,554	75,683	6,070	151,319	59.2	104,018	77,516	73,720	33,470
	6 mos.	342	1,300,072	29,905	1,375,784	215,231	175,892	44,243	494,196	38,051	967,006	70.3	408,778	282,275	250,998	109,973
Baltimore & Ohio	June	5,653	11,169,374	1,430,863	13,717,579	1,039,041	2,709,381	547,619	4,871,790	625,971	9,971,965	72.7	3,745,614	3,362,789	3,082,903	3,693,677
	6 mos.	5,653	68,691,601	7,740,814	82,352,893	7,340,980	18,178,657	3,057,035	31,215,347	3,978,703	64,685,110	78.6	17,667,783	13,156,170	11,528,249	17,722,855
Baltimore & Ohio Chic. Term	June	85	.....	.....	255,569	25,857	31,917	2,431	131,295	18,303	214,578	84.0	40,991	—11,419	74,362	105,738
	6 mos.	85	.....	.....	1,564,741	188,178	192,440	13,834	833,087	111,319	1,373,034	87.7	191,707	—87,243	464,287	548,287
Staten Island Rapid Transit	June	23	65,576	129,540	204,452	11,333	13,540	2,145	90,009	16,218	133,245	65.2	71,207	54,107	39,203	39,052
	6 mos.	23	345,308	678,178	1,074,991	77,454	79,674	12,233	551,173	95,651	816,185	75.9	258,806	153,706	71,179	134,990
Bangor & Oroostook	June	619	256,339	22,987	307,467	124,847	120,320	6,084	120,795	27,210	401,405	130.6	—93,938	—114,800	—95,713	58,786
	6 mos.	619	3,774,361	256,094	4,193,081	741,544	723,952	34,996	974,598	168,810	2,655,912	63.3	1,537,169	1,176,375	1,150,031	1,688,338
Belt Ry. Co. of Chicago	June	53	.....	.....	421,453	21,658	43,043	3,457	193,830	9,268	271,256	64.4	150,197	74,774	105,358	154,657
	6 mos.	53	.....	.....	2,700,252	156,169	254,842	21,413	1,281,990	60,543	1,774,957	65.7	925,295	523,188	729,964	912,721
Bessemer & Lake Erie	June	227	1,130,847	1,632	1,143,491	79,056	151,268	12,161	222,709	39,738	507,223	44.3	636,268	524,262	515,858	855,015
	6 mos.	227	3,831,270	15,717	3,922,019	622,579	1,499,874	83,766	1,227,763	222,862	3,664,669	93.4	257,350	7,124	—12,465	1,481,388
Boston & Maine	June	2,089	3,200,693	1,034,924	5,010,777	779,072	721,904	90,033	1,765,377	214,215	3,588,634	71.6	1,422,143	1,136,826	934,943	1,018,300
	6 mos.	2,089	19,969,487	5,923,984	30,157,305	4,622,631	4,258,351	505,016	11,194,788	1,341,435	22,037,186	73.1	8,120,119	6,547,177	5,202,021	5,764,435
Brooklyn Eastern Dist. Term	June	11	106,156	.....	107,697	10,628	13,788	404	32,384	5,890	63,094	58.6	44,603	37,697	37,697	36,890
	6 mos.	11	620,326	.....	629,594	60,698	67,546	3,806	196,391	34,939	363,380	57.7	266,214	224,978	224,978	236,310
Buffalo & Susquehanna	June	253	105,575	328	119,659	26,552	27,193	1,895	36,046	6,738	98,424	82.3	21,235	19,112	22,452	40,216
	6 mos.	253	706,346	2,604	791,188	152,255	204,955	12,646	238,719	42,299	651,374	82.3	139,814	127,191	173,885	190,464
Buffalo, Rochester & Pittsburgh	June	601	1,044,582	29,516	1,112,803	143,638	272,839	25,176	418,320	37,726	899,318	80.8	213,485	192,836	156,997	117,077
	6 mos.	601	5,906,039	215,906	6,343,265	771,155	1,734,699	169,820	2,605,190	239,987	5,531,473	87.2	811,792	690,569	685,552	990,968
Burlington-Rock Island	June	310	73,722	2,115	81,213	21,702	12,806	6,638	41,742	10,857	92,352	113.7	—11,139	—17,229	—32,743	—129,008
	6 mos.	357	567,371	14,796	618,626	156,373	98,318	39,284	320,113	63,668	673,729	108.9	—55,103	—100,983	—248,814	—776,916
Canadian Pacific Lines in Maine	June	233	95,458	22,583	128,432	59,195	27,308	7,952	62,423	4,811	161,689	125.9	—33,257	—45,257	—71,591	—121,529
	6 mos.	233	1,063,497	130,525	1,270,567	242,931	282,859	47,539	554,449	25,959	1,153,737	90.8	116,830	44,830	—86,577	—74,846
Canadian Pacific Lines in Vermont	June	85	73,470	20,109	115,682	27,192	21,045	2,133	72,373	2,378	125,121	108.1	—9,439	—13,459	—41,344	—30,698
	6 mos.	85	453,142	120,241	700,200	120,278	168,569	13,159	467,774	16,324	786,036	112.2	—85,836	—109,956	—272,946	—235,560
Central of Georgia	June	1,944	1,128,447	159,800	1,427,091	179,954	296,861	67,824	615,769	78,958	1,247,731	87.4	179,360	60,484	49,218	127,856
	6 mos.	1,944	6,996,225	1,087,946	9,116,864	857,411	1,647,605	396,574	3,858,004	473,556	7,300,654	80.1	1,816,210	1,110,119	1,047,059	1,647,721
Central New Jersey	June	692	2,446,333	584,728	3,251,728	336,520	704,154	61,364	1,359,692	110,555	2,593,387	79.8	658,341	258,719	178,748	417,930
	6 mos.	692	15,834,952	3,277,604	20,432,880	1,908,585	4,281,633	345,727	8,420,604	688,041	15,777,613	77.2	4,655,267	2,862,799	2,311,695	3,033,231
Central Vermont	June	456	422,779	77,258	563,569	240,132	103,067	18,861	231,882	22,851	618,590	109.76	—55,021	—60,912	—64,569	106,971
	6 mos.	456	2,722,264	428,849	3,477,903	775,665	644,442	105,682	1,480,964	148,055	3,166,060	91.03	311,843	235,498	294,055	599,320
Chesapeake & Ohio	June	3,119	9,558,357	393,135	10,495,700	1,229,274	1,816,642	177,795	2,496,677	325,775	6,044,471	57.6	4,451,229	3,630,705	3,567,889	3,299,091
	6 mos.	3,119	53,856,025	2,222,651	59,009,701	7,974,815	11,510,639	1,006,844	15,305,407	2,046,884	37,943,756	64.3	21,065,945	15,905,633	15,930,511	18,331,704
Chicago & Alton	June	1,028	1,239,938	273,880	1,681,484	243,446	343,011	67,854	640,784	57,369	1,370,759	81.5	310,725	192,691	32,433	—60,922
	6 mos.	1,028	7,093,477	1,719,920	9,839,111	1,071,085	2,028,825	418,807	3,974,943	370,168	7,974,848	81.1	1,864,263	1,167,628	237,638	103,192
Chicago & Eastern Illinois	June	938	922,025	150,428	1,196,802	164,701	251,713	69,970	547,851	66,984	1,111,762	92.9	85,040	—30,578	—166,445	—211,157
	6 mos.	938	6,090,436	962,534	7,783,612	1,028,099	1,701,115	427,977	3,555,403	412,451	7,206,565	92.6	577,047	—125,492	—951,389	—446,172
Chicago & Illinois Midland	June	131	200,154	2,562	210,828	33,236	53,434	19,410	62,205	19,660	187,512	88.9	23,316	14,481	13,386	23,954
	6 mos.	131	1,292,953	17,773	1,354,670	155,056	336,161	118,993	428,999	120,116	1,158,675	85.5	195,995	152,965	112,124	186,810

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
Chicago & North Western	June	8,458	$6,810,794	$1,576,238	$9,422,248	$1,616,388	$1,742,607	$235,959	$3,471,118	$367,541	$7,478,914	79.4	$1,943,334	$1,217,905	$970,785	$1,761,807
	6 mos.	8,458	38,780,858	7,726,499	52,404,828	7,851,667	10,479,127	1,206,418	21,521,773	2,265,879	43,611,662	83.2	8,793,166	4,439,962	3,093,872	6,195,784
Chicago, Burlington & Quincy	June	9,306	7,185,340	1,086,731	9,250,329	1,421,613	1,607,326	269,827	3,160,930	352,901	6,889,579	74.5	2,360,750	1,541,815	1,325,742	1,728,806
	6 mos.	9,318	45,300,510	5,629,772	57,029,615	7,001,373	9,318,578	1,526,422	19,704,940	2,143,754	40,098,120	70.3	16,931,495	11,745,463	10,216,112	12,663,223
Chicago Great Western	June	1,495	1,440,926	111,542	1,678,804	273,595	190,172	87,527	599,472	59,428	1,315,969	72.4	462,835	379,692	186,600	154,145
	6 mos.	1,495	8,413,166	665,854	9,792,207	1,178,049	1,133,805	496,194	3,729,034	353,728	6,918,200	70.7	2,874,007	2,364,950	1,231,692	1,008,507
Chicago, Indianapolis & Louisville	June	647	777,274	87,386	966,136	112,038	188,751	34,386	371,851	32,611	747,901	77.4	218,235	152,032	41,034	171,687
	6 mos.	647	4,670,375	605,147	5,872,197	573,922	1,219,613	210,147	2,363,192	205,121	4,629,863	78.8	1,242,334	860,609	193,390	634,007
Chicago, Mil., St. Paul & Pacific	June	11,323	8,240,391	922,417	10,107,715	2,329,042	1,707,587	294,438	3,624,161	322,454	8,264,739	81.8	1,842,976	1,077,148	650,311	583,689
	6 mos.	11,322	46,471,924	4,634,904	56,812,124	9,446,900	11,880,006	1,703,238	22,417,257	2,044,441	47,511,190	83.6	9,300,934	4,632,166	2,285,974	4,959,407
Chicago River & Indiana	June	20	.....	.....	434,865	32,000	35,000	1,713	155,789	18,894	243,396	56.0	191,469	141,672	220,700	262,705
	6 mos.	20	.....	.....	2,776,298	250,000	230,000	11,278	957,036	113,948	1,562,262	56.3	1,214,036	953,028	1,396,929	1,505,446
Chicago Rock Island & Pacific	June	7,593	6,780,376	920,991	8,512,721	1,020,050	1,470,171	229,067	3,016,321	334,566	6,166,505	72.4	2,346,216	1,816,535	1,387,862	1,496,120
	6 mos.	7,593	37,918,390	5,456,306	48,141,684	5,341,621	8,758,639	1,408,399	18,635,839	2,046,409	36,771,272	76.4	11,370,412	8,122,620	5,731,424	6,989,851
Chicago Rock Island & Gulf	June	722	368,723	36,763	441,604	71,590	37,770	22,829	169,715	21,943	327,734	74.2	113,870	91,813	62,174	157,688
	6 mos.	641	2,204,103	266,812	2,694,931	380,635	237,454	124,849	939,159	134,426	2,836,204	68.1	858,727	714,949	542,187	623,396
Chic., St. Paul, Minn. & Omaha	June	1,736	1,243,312	241,000	1,650,437	256,000	294,764	38,176	700,937	83,844	1,386,352	84.0	264,085	166,546	104,882	152,265
	6 mos.	1,736	7,350,008	1,204,924	9,407,550	1,428,873	1,849,072	235,934	4,341,008	503,402	8,419,965	89.5	987,585	418,509	5,738	840,380
Clinchfield R. R.	June	309	430,578	5,468	444,023	54,776	109,509	18,481	95,578	17,354	295,698	66.6	148,325	83,324	92,918	105,437
	6 mos.	309	2,755,606	41,184	2,849,058	324,779	701,490	115,581	633,497	105,336	1,880,023	66.0	969,035	579,023	805,523	1,038,365
Colorado & Southern	June	1,037	460,929	46,264	566,667	115,977	109,173	17,637	221,476	39,636	506,570	89.4	60,097	—7,584	—25,901	—41,560
	6 mos.	1,037	3,132,102	281,106	3,788,923	556,212	837,897	92,947	1,463,673	239,916	3,199,404	84.4	589,519	184,560	71,129	463,809
Ft. Worth & Denver City	June	796	517,601	69,981	630,562	76,859	105,655	22,079	210,173	38,737	456,433	72.4	174,129	140,476	116,493	193,779
	6 mos.	713	2,674,825	411,747	3,350,454	404,746	594,816	118,633	1,150,461	225,995	2,508,539	74.9	841,915	632,393	537,927	782,433
Wichita Valley	June	270	50,722	1,204	55,374	12,820	3,526	26	24,144	1,847	42,063	76.0	13,311	6,623	—3,496	—31,991
	6 mos.	270	251,355	8,132	278,255	78,814	22,593	92	139,569	10,419	250,871	90.2	27,384	—14,265	—75,567	—92,190
Columbus & Greenville	June	167	79,860	5,358	90,073	16,162	14,658	4,332	34,276	10,759	80,187	89.0	9,886	6,866	7,581	239
	6 mos.	167	473,058	38,015	542,107	87,551	80,086	23,402	215,001	69,215	475,241	87.7	66,866	52,654	57,993	80,925
Conemaugh & Black Lick	June	20	35,250	.....	57,605	7,327	16,358	467	32,877	3,376	60,405	104.9	—2,800	—3,700	31	36,396
	6 mos.	20	188,353	.....	390,032	55,361	113,687	3,214	269,738	20,797	462,797	118.7	—72,765	—78,165	—58,888	117,070
Delaware & Hudson	June	882	2,193,831	149,927	2,547,368	353,297	652,176	56,266	939,925	152,601	2,162,428	84.9	384,940	322,033	325,862	401,440
	6 mos.	882	13,704,888	963,373	15,733,658	2,453,327	4,010,106	335,639	6,050,037	923,517	13,811,741	87.8	1,921,917	1,403,369	1,482,956	2,339,300
Delaware, Lackawanna & Western	June	998	3,686,666	718,852	5,117,669	553,756	961,478	151,404	2,026,504	178,489	3,910,827	76.4	1,206,842	724,321	715,680	973,219
	6 mos.	998	22,267,723	4,320,813	30,667,202	2,983,482	5,802,098	833,446	12,990,247	1,058,328	23,906,938	78.0	6,760,264	4,009,671	3,933,859	5,025,259
Denver & Rio Grande Western	June	2,536	1,342,978	175,612	1,679,011	230,637	354,794	55,963	533,856	84,870	1,273,515	75.8	405,496	240,414	251,640	465,132
	6 mos.	2,551	9,474,232	777,396	11,068,897	1,358,925	2,550,222	329,326	3,533,406	520,016	8,374,732	75.7	2,694,165	1,702,868	1,812,648	2,656,095
Denver & Salt Lake	June	232	112,190	8,080	133,603	35,349	34,770	1,909	26,658	10,709	109,395	81.9	24,208	8,208	12,199	2,670
	6 mos.	232	780,708	52,900	912,671	179,961	221,294	11,332	180,532	65,195	658,314	72.1	254,357	158,345	201,896	328,949
Detroit & Mackinac	June	242	101,532	5,135	114,557	27,138	20,489	1,441	28,908	4,960	81,337	71.0	33,220	25,994	25,408	—6,759
	6 mos.	242	437,481	28,562	516,128	97,794	96,279	8,448	165,169	26,208	391,165	75.8	124,963	97,647	92,790	—8,449
Detroit & Toledo Shore Line	June	50	216,636	.....	220,405	32,539	25,556	7,609	67,264	9,170	142,058	64.5	78,347	58,459	15,655	24,456
	6 mos.	50	1,609,589	.....	1,633,665	179,889	164,685	45,852	454,511	48,932	892,141	54.6	741,524	597,296	283,231	490,581
Detroit Terminal	June	19	.....	.....	68,738	10,503	8,096	.....	39,373	4,113	62,085	90.3	6,653	—4,033	—13,543	—4,212
	6 mos.	19	.....	.....	544,836	54,648	55,331	6	287,998	24,472	422,455	77.5	122,381	44,561	—2,627	101,726
Detroit, Toledo & Ironton	June	487	457,574	1,045	477,705	56,325	77,040	12,619	166,416	28,584	338,759	70.9	138,946	90,833	82,752	288,550
	6 mos.	498	3,473,049	6,475	3,571,386	428,268	524,122	76,511	1,137,952	186,788	2,347,335	65.7	1,224,051	932,995	820,100	2,530,626
Duluth, Missabe & Northern	June	563	1,711,023	3,285	1,938,504	276,583	269,071	3,006	337,978	42,630	929,090	47.9	1,009,414	982,499	982,678	2,055,510
	6 mos.	564	2,965,835	20,338	3,421,463	1,311,705	1,807,460	24,218	1,336,695	236,728	4,716,232	137.8	1,294,769	—1,651,537	—1,653,212	1,314,546
Duluth, Winnipeg & Pacific	June	178	70,427	7,196	87,425	34,285	36,766	4,163	48,442	6,661	131,858	150.8	44,433	—48,232	—47,888	—7,287
	6 mos.	178	556,284	37,944	634,532	162,261	213,848	26,706	334,471	43,630	788,341	124.2	—153,809	—185,687	—137,377	26,530
Elgin, Joliet & Eastern	June	447	949,051	3	1,050,436	179,556	5,931	15,551	473,555	59,851	733,417	69.8	317,019	174,082	112,882	136,618
	6 mos.	447	7,355,250	27	8,080,062	1,051,101	1,603,274	92,597	3,317,364	324,487	6,387,177	79.0	1,692,825	977,546	516,781	1,687,659
Erie Railroad	June	2,046	5,441,725	684,921	6,779,181	1,028,801	1,380,065	166,603	2,571,005	280,615	5,459,318	80.5	1,319,863	903,557	792,929	1,359,152
	6 mos.	2,046	33,589,169	3,885,723	40,998,139	4,913,999	8,937,345	985,861	15,828,461	1,697,021	32,547,290	79.4	8,450,849	6,136,567	5,714,689	6,055,699
Chicago & Erie	June	269	794,072	50,684	938,566	123,001	120,894	29,515	272,918	40,998	586,851	62.5	351,715	295,604	52,836	56,545
	6 mos.	269	4,998,175	226,970	5,635,966	663,293	686,435	175,865	1,684,533	250,833	3,458,173	61.4	2,177,793	1,841,423	368,422	843,077

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
New Jersey & New York	June	45	$22,704	$85,893	$112,802	$13,833	$27,875	$1,417	$54,321	$3,492	$100,938	89.5	$11,864	$7,490	—$15,388	—$15,857
	6 mos.	45	144,011	504,715	670,645	65,034	124,275	8,285	338,309	21,327	557,219	83.1	113,426	87,061	—87,445	—134,548
N. Y., Susquehanna & Western	June	131	278,708	35,302	341,108	53,089	57,553	4,648	153,402	11,637	280,318	82.2	60,790	28,080	10,973	52,015
	6 mos.	131	1,945,181	206,244	2,338,440	240,415	296,692	28,371	929,360	76,910	1,571,600	67.2	766,840	570,263	396,818	265,259
Florida East Coast	June	864	402,790	102,824	578,801	105,041	118,785	24,084	193,738	44,280	493,832	85.3	84,969	—29,397	—121,411	—342,959
	6 mos.	864	3,599,984	1,914,433	6,327,109	746,241	941,821	183,846	1,724,218	277,943	3,980,772	62.9	2,346,337	1,648,579	1,242,019	1,544,637
Fort Smith & Western	June	249	45,025	2,988	53,077	14,247	15,130	4,577	24,346	5,165	63,130	118.9	—10,053	—13,639	—21,611	—8,073
	6 mos.	249	346,437	19,869	400,669	79,624	79,922	29,180	175,452	33,588	393,502	98.2	7,167	—14,490	—67,375	—13,863
Galveston Wharf	June	13	.....	.....	123,676	35,741	4,376	4,070	31,928	7,434	98,625	79.7	25,051	2,051	2,049	—4,491
	6 mos.	13	.....	.....	773,524	209,679	29,557	24,064	162,931	52,161	557,581	72.1	215,943	77,708	77,879	22,735
Georgia R. R.	June	328	305,675	31,997	365,950	38,230	65,312	21,270	150,790	22,783	298,943	81.7	67,007	58,369	70,656	51,012
	6 mos.	328	1,781,003	178,269	2,130,907	216,314	403,176	126,425	953,145	139,349	1,840,680	86.4	290,227	243,174	310,756	324,973
Georgia & Florida	June	463	102,125	3,222	111,565	29,168	19,054	10,078	45,412	7,426	111,337	99.8	228	—7,272	—13,495	—15,120
	6 mos.	463	667,679	20,739	728,004	181,255	126,267	63,064	299,471	46,341	717,345	98.5	10,659	—34,343	—58,747	—40,522
Grand Trunk Western	June	1,021	1,553,964	119,586	1,832,342	302,568	353,975	61,028	804,469	100,471	1,621,415	88.5	210,927	94,573	—47,893	—180,669
	6 mos.	1,019	9,691,952	654,454	11,160,296	1,637,719	2,247,277	391,292	4,896,885	627,015	9,837,208	88.1	1,323,088	610,618	—458,998	1,046,310
Canadian Nat. Lines in New Eng.	June	172	91,595	12,635	117,518	45,377	39,281	4,995	98,886	8,092	198,462	168.9	—80,944	—94,254	—135,724	—110,237
	6 mos.	172	576,666	84,305	752,398	164,741	217,199	32,380	502,493	51,708	987,992	131.3	—235,594	—324,889	—600,896	—508,198
Great Northern	June	8,370	5,499,080	586,813	6,831,401	1,158,706	1,158,380	233,196	2,084,980	224,976	4,918,786	72.0	1,912,615	1,259,282	1,177,087	1,729,328
	6 mos.	8,370	29,739,411	2,996,083	36,413,418	5,369,444	8,014,773	1,400,219	13,000,756	1,385,154	29,473,777	80.9	6,939,641	2,898,514	2,170,161	3,312,197
Green Bay & Western	June	234	113,074	1,755	118,514	23,546	20,320	6,130	47,870	2,571	100,395	84.7	18,119	12,119	6,050	16,790
	6 mos.	234	685,971	10,004	714,900	128,304	149,136	34,235	299,974	18,543	629,933	88.1	84,967	38,967	27,099	151,623
Gulf & Ship Island	June	307	104,285	16,510	138,492	38,392	28,240	4,463	69,499	7,139	148,867	107.5	—10,375	—40,520	—54,934	9,063
	6 mos.	307	649,685	111,398	897,504	242,137	169,508	26,340	469,103	41,130	955,152	106.4	—57,648	—237,863	—318,454	6,266
Gulf, Mobile & Northern	June	733	293,630	10,671	321,070	54,140	64,570	27,162	133,785	20,506	300,159	93.49	20,911	—5,992	—32,633	63,111
	6 mos.	733	1,973,817	72,396	2,151,773	345,134	379,608	159,716	810,975	133,364	1,829,607	85.03	322,166	159,268	647	317,999
Illinois Central	June	5,018	6,744,656	1,087,791	8,530,734	1,264,065	1,887,655	235,337	3,244,336	364,689	7,055,364	82.7	1,475,370	973,772	850,059	1,557,362
	6 mos.	5,018	40,440,497	6,828,275	52,306,511	6,313,098	12,245,658	1,464,491	20,851,471	2,195,933	43,467,453	83.1	8,839,058	5,042,123	4,217,647	8,778,272
Yazoo & Mississippi Valley	June	1,681	1,230,652	129,418	1,445,348	288,801	268,106	41,148	598,673	67,518	1,265,162	87.5	180,186	—8,661	—128,253	155,932
	6 mos.	1,683	7,165,775	785,156	8,526,474	1,476,197	1,646,077	250,695	3,782,122	407,347	7,579,341	88.9	947,133	—60,254	—824,878	1,243,721
Illinois Central System	June	6,700	7,975,308	1,217,209	9,976,082	1,552,866	2,155,761	276,485	3,843,009	432,207	8,320,526	83.4	1,655,556	965,111	721,806	1,712,024
	6 mos.	6,702	47,606,272	7,613,431	60,832,985	7,789,295	13,891,735	1,715,186	24,633,593	2,603,280	51,046,794	83.9	9,786,191	4,981,869	3,392,769	10,025,437
Illinois Terminal	June	552	474,799	80,553	581,093	69,407	65,868	19,536	177,400	35,661	366,480	63.07	214,613	182,119	154,417	81,249
	6 mos.	558	2,608,649	526,400	3,287,399	364,964	422,814	114,795	1,060,547	224,763	2,181,874	66.37	1,105,525	920,603	759,949	692,544
Kansas City Southern	June	784	839,975	45,606	1,017,755	101,378	155,145	47,673	322,427	65,850	694,575	68.2	323,180	221,463	180,663	260,575
	6 mos.	784	5,491,607	270,384	6,502,217	594,268	1,100,211	326,778	2,019,070	415,607	4,445,520	68.4	2,056,697	1,484,292	1,285,157	1,572,599
Texarkana & Ft. Smith	June	99	168,283	2,921	181,617	18,035	17,762	7,354	44,349	10,130	99,020	53.6	85,597	76,946	49,112	50,040
	6 mos.	99	857,612	18,334	977,653	93,686	77,453	44,595	278,107	60,411	566,669	58.0	410,984	359,096	216,034	213,451
Kansas, Oklahoma & Gulf	June	326	238,343	1,042	253,374	24,801	30,956	15,311	51,031	12,724	133,500	54.9	109,874	91,888	69,695	74,111
	6 mos.	326	1,256,559	7,213	1,290,441	144,444	147,671	84,599	311,279	70,084	753,725	58.4	536,716	427,070	313,294	448,850
Lake Superior & Ishpeming	June	160	148,951	191	174,861	26,183	22,865	613	33,958	9,213	92,832	53.1	82,029	64,949	64,214	172,708
	6 mos.	160	431,390	3,358	492,657	132,616	155,403	3,595	180,568	45,725	517,907	105.1	—25,250	—127,033	—137,056	104,881
Lake Terminal	June	12	.....	.....	56,868	1,557	7,145	.....	27,284	2,965	38,951	68.5	17,917	16,413	18,000	23,945
	6 mos.	12	.....	.....	323,923	52,985	59,177	.....	182,925	12,369	307,456	94.9	16,467	—8,437	—16,988	—17,722
Lehigh & Hudson River	June	96	142,419	550	151,128	24,617	28,282	4,208	54,047	10,102	121,256	80.2	29,872	18,204	2,411	20,993
	6 mos.	96	953,016	4,229	1,009,685	122,703	157,829	22,811	359,642	57,159	720,144	71.3	289,541	207,208	105,046	113,529
Lehigh & New England	June	216	318,757	768	322,771	46,102	81,613	5,181	119,658	19,392	271,938	84.3	50,833	42,255	47,652	75,588
	6 mos.	216	2,110,792	4,782	2,135,278	293,240	472,336	31,584	761,219	135,443	1,693,748	79.3	441,530	370,160	428,635	454,878
Lehigh Valley	June	1,361	3,500,166	366,161	4,238,141	452,958	902,143	138,534	1,746,670	132,332	3,394,710	80.1	843,431	549,995	437,132	788,739
	6 mos.	1,361	22,464,101	2,154,608	26,790,488	2,440,512	6,120,423	787,476	11,250,431	808,825	21,542,570	80.4	5,247,918	3,496,158	2,853,221	3,705,572
Louisiana & Arkansas	June	608	482,056	14,242	523,796	64,666	71,107	23,086	125,676	23,737	308,348	58.9	215,448	169,887	146,550	64,339
	6 mos.	608	2,508,140	78,971	2,747,577	422,945	378,118	124,880	782,908	139,274	1,849,422	67.3	898,155	621,376	521,775	529,482
Louisiana, Arkansas & Texas	June	202	58,628	1,080	62,432	18,495	11,640	2,762	25,534	4,172	62,585	100.2	— 153	—4,202	—10,034	—26,283
	6 mos.	202	347,408	7,032	370,805	103,934	53,797	20,445	155,192	27,540	360,808	97.3	9,997	—13,979	—56,241	—146,700
Louisville & Nashville	June	5,264	6,284,817	691,991	7,433,079	1,130,753	1,541,129	223,350	2,734,886	376,089	6,023,761	81.0	1,409,318	920,343	877,108	757,848
	6 mos.	5,267	38,579,697	4,425,348	46,303,494	6,881,175	10,176,457	1,417,097	17,380,902	2,313,886	38,426,256	83.0	7,877,238	4,949,938	4,816,678	5,758,620

Revenues and Expenses of Railways

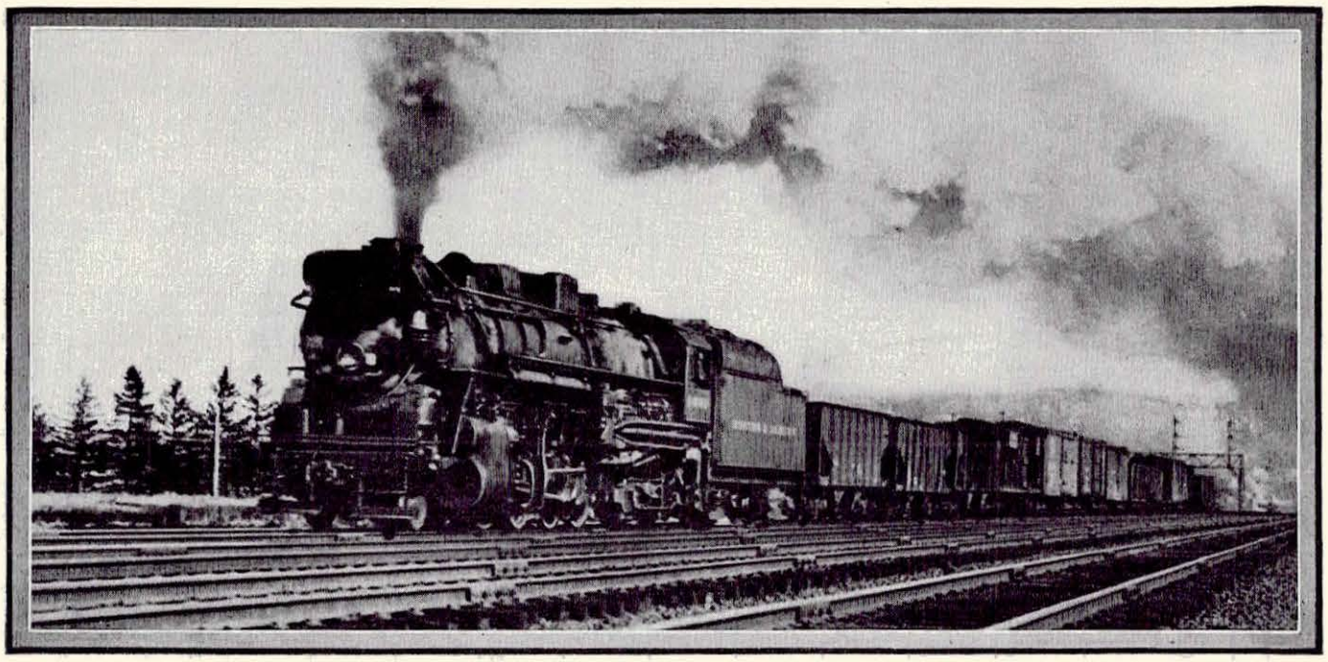
MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
Maine Central	June	1,121	$861,422	$204,227	$1,207,478	$229,203	$213,900	$24,131	$453,995	$44,841	$970,090	80.3	$237,388	$201,852	$167,672	$221,400
	6 mos.	1,121	6,115,993	1,038,613	7,885,982	1,210,898	1,365,418	109,423	3,099,716	278,373	6,070,471	77.0	1,815,511	1,323,534	986,292	1,539,695
Midland Valley	June	363	157,592	2,668	165,024	26,440	16,510	4,426	40,314	9,255	96,667	58.6	68,357	56,337	47,954	73,076
	6 mos.	363	955,953	17,157	1,011,339	179,720	129,024	31,156	284,810	66,583	688,286	68.1	323,053	246,292	182,103	392,123
Minneapolis & St. Louis	June	1,627	842,264	32,919	930,711	125,495	174,986	36,968	404,032	46,416	788,393	84.7	142,318	87,082	54,608	75,972
	6 mos.	1,627	4,641,329	194,266	5,176,038	667,449	1,064,985	223,095	2,474,801	299,977	4,727,276	91.3	448,762	139,603	—19,335	—97,020
Minn., St. Paul & S. S. Marie	June	4,379	2,163,570	209,968	2,600,779	410,171	411,722	74,589	983,237	117,653	2,013,622	77.4	587,157	380,212	245,778	460,290
	6 mos.	4,379	12,333,297	1,029,907	14,639,140	2,163,056	3,111,040	450,345	6,179,871	737,809	12,700,137	86.8	1,939,003	680,478	—124,651	506,255
Duluth, South Shore & Atlantic	June	560	176,233	19,637	224,724	81,250	42,835	7,490	105,545	9,683	248,145	110.4	—23,421	—52,421	—56,685	—21,119
	6 mos.	560	1,185,689	132,622	1,461,320	287,854	279,641	46,621	671,874	58,691	1,354,896	92.7	106,424	—74,610	—108,513	38,621
Spokane International	June	163	65,958	3,312	74,058	17,166	6,262	3,101	25,213	5,514	57,816	78.1	16,242	11,148	6,245	2,681
	6 mos.	163	338,190	21,565	389,614	80,083	39,005	20,055	150,876	34,217	327,926	84.2	61,688	31,401	8,396	7,927
Mississippi Central	June	150	77,723	2,165	82,561	12,715	9,179	8,082	25,221	5,969	61,165	74.1	21,396	15,885	11,697	—772
	6 mos.	150	461,622	13,492	491,761	85,792	77,337	52,801	153,644	39,745	409,291	83.2	82,470	48,614	27,425	91,799
Missouri & North Arkansas	June	364	77,280	2,398	85,868	23,049	15,396	9,209	37,836	8,316	93,620	109.0	—7,752	—10,271	—19,606	—1,107
	6 mos.	364	585,021	14,264	636,963	140,914	87,959	56,259	256,770	48,578	589,618	92.6	47,345	31,744	—33,115	52,241
Missouri-Illinois	June	202	118,583	958	122,735	23,975	22,312	3,527	32,641	4,927	87,325	71.1	35,410	28,850	20,662	21,642
	6 mos.	202	632,657	5,798	653,679	105,092	142,668	20,942	210,132	37,286	514,774	78.8	138,905	103,590	55,762	148,271
Missouri-Kansas-Texas Lines	June	3,188	2,228,380	301,566	2,791,424	426,602	542,913	138,916	988,553	161,157	2,277,324	81.6	514,100	303,827	73,360	610,195
	6 mos.	3,188	12,994,727	1,835,070	16,580,901	2,112,014	3,114,019	760,121	5,994,288	977,523	13,066,443	78.8	3,514,458	2,289,328	1,094,578	2,951,211
Missouri Pacific	June	7,444	6,810,004	640,269	8,197,094	987,313	1,373,548	256,879	2,882,810	323,516	5,852,764	71.4	2,344,330	1,934,098	1,500,138	1,401,112
	6 mos.	7,449	40,643,347	3,839,742	48,947,719	5,699,607	8,198,736	1,653,381	17,951,360	2,072,653	35,662,531	72.9	13,285,188	10,772,302	8,613,467	9,321,700
Gulf Coast Lines	June	1,037	796,190	58,627	907,120	132,941	166,141	42,612	207,662	59,163	610,937	67.35	296,183	246,977	198,251	204,734
	6 mos.	1,037	5,926,494	460,470	6,776,875	930,484	1,080,082	268,257	1,854,462	365,356	4,496,217	66.35	2,280,658	1,985,214	1,347,313	2,138,129
International-Great Northern	June	1,159	1,724,778	116,359	1,943,847	250,799	289,846	37,474	614,932	69,982	1,261,633	64.90	682,214	639,034	447,223	26,710
	6 mos.	1,159	8,588,156	665,119	9,919,469	1,336,729	1,515,088	230,178	3,810,821	397,493	7,232,260	72.91	2,687,209	2,436,496	1,389,618	59,310
San Antonio, Uvalde & Gulf	June	316	78,152	10,671	95,992	33,250	11,669	5,300	35,563	6,338	90,837	94.6	5,155	536	—26,312	7,056
	6 mos.	316	685,056	63,581	808,020	221,931	107,772	33,015	191,632	39,743	592,312	73.3	215,708	187,682	18,147	105,336
Mobile & Ohio	June	1,152	735,227	32,711	815,277	137,458	162,190	52,230	360,069	49,473	760,741	93.3	54,536	—16,751	—77,000	38,185
	6 mos.	1,152	4,966,658	217,330	5,513,938	753,287	1,056,543	312,245	2,280,732	302,352	4,696,298	85.2	817,640	417,208	38,300	526,302
Monongahela	June	177	423,945	2,287	429,608	60,000	45,000	1,245	91,858	9,811	207,913	48.4	221,695	201,002	127,504	106,656
	6 mos.	177	2,431,745	17,862	2,467,912	360,000	270,000	7,816	598,341	62,548	1,298,248	52.6	1,169,664	1,086,514	607,388	664,464
Monongahela Connecting	June	6	.....	.....	106,635	13,188	25,878	270	48,122	2,874	90,332	84.7	16,303	14,524	15,070	24,428
	6 mos.	6	.....	.....	608,188	84,432	153,835	1,774	310,920	17,362	568,323	93.4	39,865	7,636	9,259	151,532
Montour	June	57	149,138	.....	151,416	29,753	40,920	1,525	40,003	7,515	119,716	79.1	31,700	29,631	55,006	99,095
	6 mos.	57	988,901	.....	993,948	106,779	246,806	8,333	282,461	44,861	689,186	69.3	304,762	292,349	389,070	455,440
Nashville, Chattanooga & St. Louis	June	1,203	1,020,469	124,503	1,255,458	254,218	267,779	68,790	503,514	79,752	1,178,342	93.9	77,116	18,617	2,301	118,631
	6 mos.	1,203	6,628,094	786,732	8,180,747	1,412,208	1,687,343	431,277	3,198,983	470,070	7,236,288	88.5	944,459	594,521	488,091	1,078,889
Nevada Northern	June	165	37,358	1,247	44,639	11,303	5,626	919	9,892	4,552	32,292	72.3	12,347	4,075	6,719	18,964
	6 mos.	165	225,043	11,713	267,616	68,348	28,041	5,901	72,368	28,598	203,203	75.9	64,413	18,066	31,241	126,695
Newburgh & South Shore	June	6	.....	.....	86,004	13,587	20,821	.....	36,406	6,280	77,094	89.6	8,910	—4,084	—493	—8,636
	6 mos.	6	.....	.....	574,978	123,425	148,055	.....	265,555	41,551	578,586	100.6	—3,608	—81,676	—63,828	186,966
New Orleans Great Northern	June	264	197,825	11,726	215,376	15,514	22,808	13,464	66,340	9,721	127,847	59.4	87,529	77,165	50,015	—44,516
	6 mos.	264	1,057,125	59,197	1,149,734	112,674	163,512	84,557	341,431	63,898	766,072	66.6	383,662	321,425	199,671	128,717
New Orleans Terminal	June	20	2,416	.....	170,126	19,351	7,058	.....	44,622	1,114	72,151	42.4	97,975	86,025	70,531	68,245
	6 mos.	20	12,818	.....	791,693	104,399	57,715	.....	292,983	9,527	464,624	58.7	327,069	255,319	138,359	248,432
New York Central	June	11,421	21,163,067	8,284,193	33,888,036	4,445,981	6,647,602	780,323	12,132,947	1,376,865	25,898,600	76.4	7,989,436	5,218,326	3,781,854	6,337,135
	6 mos.	11,421	128,754,817	45,493,895	199,569,922	24,171,734	43,065,128	4,427,959	75,541,329	8,136,864	158,497,640	79.4	41,072,282	24,353,732	16,773,217	32,160,277
Indiana Harbor Belt	June	118	.....	.....	728,334	70,000	85,000	4,713	295,155	26,206	491,386	67.5	236,948	191,993	153,035	224,450
	6 mos.	118	.....	.....	4,742,336	420,000	560,000	28,010	2,185,482	167,364	3,466,780	73.1	1,275,556	1,012,688	797,308	1,237,389
Pittsburgh & Lake Erie	June	235	1,355,893	91,058	1,493,133	187,056	470,211	31,808	589,159	79,692	1,361,656	91.2	131,477	35,698	205,040	641,461
	6 mos.	234	8,597,308	661,209	9,546,788	888,602	2,851,654	196,045	3,734,102	471,071	8,164,165	85.5	1,382,623	732,158	1,857,702	3,538,042
New York, Chicago & St Louis	June	1,698	2,728,824	133,138	2,992,025	473,739	459,857	124,356	1,127,879	127,529	2,312,028	77.3	679,997	453,295	143,253	464,901
	6 mos.	1,698	17,826,498	735,169	19,259,913	2,339,311	3,391,053	741,568	7,289,966	769,106	14,553,374	75.6	4,706,539	3,348,722	1,693,069	3,235,819
N. Y., New Haven & Hartford	June	2,101	4,634,903	3,052,470	8,743,916	1,451,183	1,137,832	109,261	2,785,151	311,235	5,946,949	68.0	2,796,967	2,298,492	1,706,339	2,081,204
	6 mos.	2,115	27,853,749	17,928,545	51,793,856	6,649,920	7,783,630	583,085	17,482,894	1,794,036	35,274,833	68.1	16,519,023	13,363,010	9,729,007	11,902,681

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
New York Connecting	June	20	$150,209	$.....	$174,248	$18,637	$10,205	.....	$35,562	$1,238	$65,642	37.7	$108,606	$72,806	$48,499	$68,321
	6 mos.	20	1,006,221	.....	1,126,054	102,110	40,950	.....	213,924	6,610	363,594	32.3	762,460	542,660	374,691	523,742
New York, Ontario & Western	June	568	760,831	92,966	1,024,131	147,857	165,431	15,643	362,464	29,781	725,468	70.8	298,663	256,163	189,404	66,760
	6 mos.	568	4,235,991	293,089	293,089	5,379,744	586,486	89,766	2,180,942	171,604	4,011,234	74.6	1,368,510	1,113,225	719,972	88,088
Norfolk & Western	June	2,242	6,494,153	240,669	7,026,458	826,116	1,282,722	127,756	1,726,876	272,939	4,241,086	60.4	2,785,372	2,135,239	2,293,346	2,803,532
	6 mos.	2,238	36,367,781	1,388,154	39,274,393	4,836,284	7,960,633	741,858	10,563,115	1,566,720	25,718,371	65.5	13,556,022	9,379,380	10,087,685	15,897,071
Norfolk Southern	June	932	719,977	16,174	757,362	85,068	83,630	25,783	242,185	25,233	461,339	60.9	296,023	247,342	207,603	138,744
	6 mos.	932	2,995,658	88,935	3,240,541	473,544	503,385	152,757	1,301,514	150,105	2,580,173	79.6	660,368	367,399	250,514	348,182
Northern Pacific	June	6,789	4,384,184	705,004	5,647,057	830,306	1,159,639	233,425	2,018,011	250,065	4,574,570	81.0	1,072,487	411,053	678,769	1,103,007
	6 mos.	6,789	24,987,097	2,835,676	30,848,028	4,770,133	7,569,298	1,272,668	11,974,124	1,557,068	27,606,190	89.5	3,241,838	—684,023	1,134,769	3,005,348
Northwestern Pacific	June	441	209,550	134,733	380,604	71,535	58,159	6,476	181,532	14,756	332,384	87.3	48,220	11,971	1,970	42,824
	6 mos.	441	1,047,741	661,996	1,916,225	520,682	398,771	38,514	1,056,535	101,364	2,113,771	110.3	—197,546	—413,835	—471,530	—270,218
Oklahoma City-Ada-Atoka	June	132	72,286	1,438	75,790	16,893	2,164	1,186	17,096	2,863	40,013	52.8	35,777	30,709	16,969	—5,195
	6 mos.	132	331,150	9,230	354,501	90,231	21,221	7,373	103,049	18,426	239,410	67.5	115,091	85,092	15,098	—32,565
Pennsylvania Railroad	June	10,914	27,172,359	7,681,001	39,036,135	4,840,861	8,096,334	834,214	14,555,396	1,573,307	30,457,578	78.0	8,578,557	5,637,915	4,351,179	7,488,570
	6 mos.	10,914	164,056,681	46,708,016	234,150,061	29,798,135	50,366,169	4,823,573	91,446,974	9,625,111	189,396,792	80.9	44,753,269	29,523,234	22,639,347	46,634,599
Long Island	June	404	826,603	2,419,604	3,414,354	263,127	435,193	18,820	1,218,074	62,011	1,997,145	58.5	1,417,209	1,061,895	907,010	972,773
	6 mos.	404	4,954,651	11,896,023	17,770,026	1,695,163	2,810,474	99,901	7,251,375	373,316	12,230,016	68.8	5,540,010	4,279,770	3,299,111	3,065,189
Peoria & Pekin Union	June	17	9,563	436	84,876	15,928	15,754	5,217	44,020	7,062	87,981	103.7	—3,105	—17,605	5,746	22,342
	6 mos.	17	51,716	3,000	584,255	75,964	73,427	30,231	294,732	45,636	519,990	89.0	64,265	—30,735	123,309	156,199
Pere Marquette	June	2,264	2,182,049	137,041	2,473,615	423,575	476,138	74,705	908,799	122,268	2,013,091	81.4	460,524	306,764	180,136	366,721
	6 mos.	2,265	12,632,945	747,324	14,237,617	2,305,565	2,823,397	421,972	5,723,915	641,971	11,962,589	84.0	2,275,028	1,356,258	811,654	2,114,510
Pittsburgh & Shawmut	June	102	75,100	579	76,247	11,339	18,219	1,437	20,569	4,037	55,601	72.9	20,646	19,539	22,313	29,780
	6 mos.	102	456,941	8,703	470,200	74,882	126,874	9,525	128,714	25,480	365,475	77.7	104,725	96,415	100,485	172,648
Pittsburgh & West Virginia	June	138	140,355	1,980	163,426	43,839	59,781	19,558	50,652	17,087	199,599	122.1	—36,173	—66,283	—63,230	159,973
	6 mos.	138	1,327,664	12,949	1,491,959	188,066	396,193	118,430	320,606	110,449	1,188,308	79.6	303,651	151,520	312,914	830,599
Pittsburgh, Shawmut & Northern	June	198	108,142	298	110,482	29,365	21,638	1,437	36,908	7,013	96,361	87.2	14,121	11,117	7,931	—17,962
	6 mos.	198	634,698	2,222	650,229	109,303	120,136	8,890	226,013	41,121	505,463	77.7	144,766	127,768	106,903	98,173
Quincy, Omaha & Kansas City	June	249	31,617	3,175	40,920	19,851	5,269	664	19,011	2,506	47,299	115.6	—6,379	—11,139	—13,442	—30,003
	6 mos.	249	164,669	20,852	217,182	93,369	31,591	5,404	117,500	14,007	261,332	120.3	—44,150	—72,690	—86,871	—76,871
Reading	June	1,459	4,848,668	365,646	5,571,120	972,305	1,549,784	96,200	2,307,568	224,762	5,170,514	92.8	400,606	181,252	160,018	889,357
	6 mos.	1,455	32,193,445	2,438,271	37,102,362	5,701,014	9,862,774	560,680	15,220,136	1,352,565	32,825,028	88.5	4,277,334	2,944,900	2,760,076	5,770,508
Atlantic City	June	163	110,114	143,786	269,159	42,660	22,095	5,634	156,978	9,375	236,969	88.0	32,190	—3,540	—12,131	—41,329
	6 mos.	163	643,645	441,205	1,160,273	330,785	117,598	25,013	898,849	30,651	1,404,073	121.0	—243,800	—487,530	—544,157	—599,872
Richmond, Fredericksburg & Pot	June	117	524,634	148,734	809,768	86,298	157,571	9,959	296,370	37,247	602,003	74.3	207,765	162,458	112,898	38,260
	6 mos.	117	2,877,343	1,487,330	5,339,551	418,748	905,747	56,625	1,847,685	221,194	3,574,157	66.9	1,765,394	1,448,412	1,036,828	838,303
Rutland	June	413	232,865	52,751	382,388	89,643	75,851	10,765	156,921	18,814	341,714	89.4	40,674	19,665	22,238	36,295
	6 mos.	413	1,372,454	350,872	2,253,461	450,380	460,811	67,095	992,346	105,070	2,073,906	92.0	179,555	54,251	80,728	261,973
St. Louis-San Francisco	June	5,266	3,891,546	517,806	4,853,332	522,474	851,087	113,211	1,688,682	200,973	3,417,582	70.4	1,435,750	1,061,094	984,621	1,175,817
	6 mos.	5,266	23,092,101	2,919,924	28,533,045	3,050,715	5,119,464	705,633	10,339,406	1,230,297	20,662,573	72.4	7,870,472	5,744,345	5,433,281	7,628,240
Ft. Worth & Rio Grande	June	233	67,789	4,023	76,910	20,212	12,917	4,070	35,222	5,565	77,934	101.3	—1,024	—5,472	—14,343	—9,072
	6 mos.	233	287,165	22,907	351,566	111,055	82,787	19,532	211,075	26,550	450,654	128.2	—99,088	—126,697	—184,430	—145,015
St. Louis, San Francisco & Texas	June	262	126,557	6,801	142,631	23,513	19,313	5,070	50,387	6,596	105,114	73.7	37,517	33,483	1,277	—2,096
	6 mos.	262	568,498	41,572	642,092	141,976	111,819	34,590	306,006	45,692	640,584	99.8	1,508	—23,621	—211,238	—142,511
St. Louis Southwestern Lines	June	1,913	1,717,721	33,459	1,838,115	170,770	192,678	90,748	577,978	78,680	1,116,681	60.8	721,434	630,501	451,614	248,823
	6 mos.	1,913	8,511,309	257,104	9,369,587	1,163,685	1,391,498	604,778	3,302,798	505,070	7,000,854	74.7	2,368,733	1,835,797	958,113	1,323,149
San Diego & Arizona	June	155	86,185	8,548	95,903	14,784	14,112	3,374	24,307	6,736	64,293	67.0	31,610	26,029	27,728	29,177
	6 mos.	155	369,047	88,107	469,008	85,778	87,429	20,607	136,467	43,070	380,030	81.0	88,978	55,493	65,171	153,745
Seaboard Air Line	June	4,480	2,905,184	261,661	3,481,638	590,930	729,070	173,601	1,323,564	179,457	3,026,590	86.9	455,048	152,544	163,908	344,924
	6 mos.	4,480	19,602,439	2,674,449	24,620,072	4,061,014	4,400,469	1,089,950	8,752,886	1,063,975	19,646,426	79.8	4,973,646	2,965,273	2,283,814	3,667,742
Southern Ry.	June	6,730	6,502,645	1,126,127	8,302,945	1,286,897	1,815,906	219,777	3,074,120	350,857	6,808,253	82.0	1,494,692	854,533	649,698	675,442
	6 mos.	6,730	40,479,814	6,654,368	51,297,303	7,971,950	10,825,629	1,350,714	19,541,005	2,065,385	42,134,162	82.1	9,163,141	5,237,772	3,960,175	7,931,674
Alabama Great Southern	June	315	429,847	77,788	545,548	110,228	129,977	15,362	191,240	22,341	473,300	86.8	72,248	28,339	39,687	79,165
	6 mos.	315	2,575,739	417,233	3,229,396	654,902	794,457	98,397	1,174,235	134,009	2,882,618	89.3	346,778	88,208	157,512	630,466
Cinn., New Orleans & Tex. Pac.	June	338	1,109,800	109,167	1,288,968	221,501	310,343	33,132	353,420	54,850	976,057	75.7	312,911	238,724	230,058	159,429
	6 mos.	338	6,473,674	796,719	7,750,731	1,443,011	1,926,606	213,423	2,427,749	323,816	6,378,798	82.3	1,371,933	930,523	908,511	1,670,307



Berkshire Type Locomotive on the Boston and Albany pulling a west bound freight through Riverside, Mass

Boston & Albany cuts its schedules with LIMA SUPER-POWER LOCOMOTIVES

● IMPROVED fast-freight service from Boston, resulting in one day's better delivery time to all western territory, has been established by the Boston and Albany Railroad.

Better service to shippers is one way of meeting competition.

But superior service cannot be supplied with the kind of locomotives you now have "white-leaded."

Better service requires modern power. Be sure you have enough of it to take care of traffic when business improves.

Not only has improvement in efficiency made old power obsolete but changed conditions of operation have also put many a locomotive on the scrap heap. Get ready now for better times.

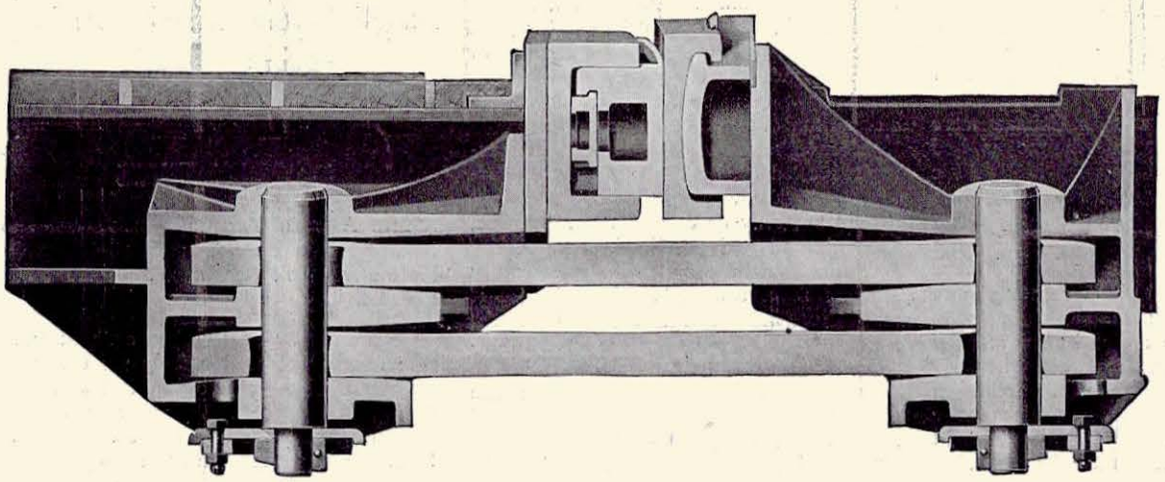
LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS · Incorporated
LIMA . . . . . OHIO

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1931—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1930.
Georgia Southern & Florida	June	397	$218,470	$26,033	$263,206	$52,435	$73,324	$2,508	$86,460	$2,707	$220,189	83.7	$43,017	$20,993	$8,930	—$17,341
	6 mos.	397	1,177,777	329,747	1,640,149	339,113	379,890	13,582	588,292	16,626	1,368,270	83.4	271,878	152,856	123,906	154,582
New Orleans & Northeastern	June	204	205,143	35,871	261,235	49,611	66,067	8,278	99,404	14,427	239,961	91.9	21,274	—17,170	—36,342	14,473
	6 mos.	204	1,297,287	208,954	1,629,044	306,028	394,524	56,926	635,000	84,874	1,492,209	91.6	136,835	—100,285	—237,654	146,232
Northern Alabama	June	110	47,251	1,474	50,850	16,419	2,586	1,920	18,243	2,697	41,865	82.3	8,985	3,456	—9,254	—8,086
	6 mos.	110	333,261	13,271	359,705	100,637	15,564	10,867	138,633	16,968	282,669	78.6	77,036	43,843	—40,836	35,866
Southern Pacific	June	9,120	10,813,230	2,605,217	14,598,526	1,502,647	1,841,320	387,707	4,656,867	581,733	9,222,660	63.2	5,375,866	4,171,346	3,449,415	3,008,778
	6 mos.	9,126	54,968,650	14,511,214	76,414,760	9,508,513	13,487,462	2,235,915	27,176,833	3,666,012	57,506,417	75.3	18,908,343	11,903,769	9,456,193	13,967,602
So. Pacific Steamship Lines	June	....	501,866	57,563	598,359	18,044	149,802	21,333	389,569	31,384	610,132	102.0	—11,773	—14,469	—14,601	—32,242
	6 mos.	....	2,763,028	243,780	3,216,075	121,091	896,383	123,719	2,407,138	193,937	3,742,268	116.4	—526,193	—535,328	—536,120	—344,644
Texas & New Orleans	June	4,700	3,394,455	478,653	4,252,279	672,997	659,304	157,215	1,436,671	228,299	3,161,963	74.4	1,090,316	817,657	447,639	375,514
	6 mos.	4,700	18,228,019	3,010,929	23,727,629	3,933,012	4,705,717	989,988	8,829,463	1,414,186	19,948,348	84.1	3,779,281	2,245,672	686,396	2,226,456
Spokane, Portland & Seattle	June	555	473,870	73,234	599,314	57,352	68,090	13,259	160,646	23,507	324,357	54.1	274,957	186,684	172,562	107,763
	6 mos.	555	2,479,661	309,988	3,069,319	328,897	463,489	69,759	1,024,509	136,610	2,035,493	66.3	1,033,826	515,720	481,308	520,650
Tennessee Central	June	295	197,359	8,425	215,760	42,515	37,584	8,409	79,456	12,496	180,100	83.5	35,660	30,187	16,462	71,179
	6 mos.	295	1,252,476	49,671	1,367,285	273,602	227,655	52,290	505,231	83,052	1,139,472	83.3	227,813	194,147	100,653	139,920
Terminal R. R. Assn. of St. Louis	June	55	.....	.....	668,973	96,617	63,175	4,229	322,313	21,276	510,860	76.4	158,113	62,557	132,283	180,403
	6 mos.	55	.....	.....	4,181,711	576,089	408,023	22,531	2,038,182	138,570	3,201,424	76.6	980,287	425,507	892,229	1,219,378
Texas & Pacific	June	1,950	2,384,605	308,300	2,910,099	307,987	466,145	81,251	869,899	116,997	1,865,324	64.1	1,044,775	869,101	650,950	661,552
	6 mos.	1,952	12,842,847	1,763,321	15,902,012	1,878,120	2,556,899	487,393	5,065,248	699,412	10,784,369	67.8	5,117,643	4,253,018	3,078,418	3,439,384
Texas Mexican	June	162	53,394	1,680	60,051	13,644	16,106	3,314	34,824	8,435	75,741	126.1	—15,690	—20,738	—27,043	—4,938
	6 mos.	162	415,155	10,488	508,366	97,659	95,125	21,050	234,601	47,630	492,472	96.9	15,894	—14,211	—53,263	—11,888
Toledo, Peoria & Western	June	239	136,527	97	139,151	26,222	14,552	15,160	46,078	10,574	112,586	80.9	26,565	22,364	14,710	6,317
	6 mos.	239	773,932	684	791,388	134,963	78,459	87,128	286,648	55,124	642,322	81.2	149,066	120,612	82,791	63,645
Toledo Terminal	June	28	.....	.....	74,400	21,006	14,261	571	35,186	4,898	75,881	101.9	—1,481	—15,995	7,545	555
	6 mos.	28	.....	.....	550,352	86,589	83,971	3,431	231,012	29,525	434,481	78.9	115,871	30,972	175,847	143,983
Ulster & Delaware	June	128	33,193	7,031	78,101	21,551	14,425	1,212	37,072	3,784	78,044	99.9	57	—6,143	—7,300	—1,141
	6 mos.	128	186,349	17,596	428,375	90,744	75,303	6,893	213,453	23,172	409,565	95.6	18,810	—11,790	—23,280	—19,641
Union R. R. of Penna.	June	45	.....	.....	504,424	59,735	112,173	168	193,977	14,606	380,659	75.5	123,765	107,687	161,551	355,997
	6 mos.	45	.....	.....	2,664,876	521,775	859,242	972	1,372,840	86,819	2,841,607	106.6	—176,731	—239,709	79,492	1,010,851
Union Pacific	June	3,765	5,479,546	1,032,573	7,225,417	1,114,414	1,732,311	207,431	2,051,402	373,499	5,632,050	77.9	1,593,367	986,190	822,140	1,064,627
	6 mos.	3,765	34,239,078	4,817,453	43,158,589	5,029,553	10,084,876	1,058,611	12,982,810	2,069,682	31,987,445	74.1	11,171,144	7,421,620	6,032,781	6,926,741
Oregon Short Line	June	2,531	1,667,067	236,380	2,122,040	452,916	383,697	56,428	698,902	136,263	1,778,867	83.8	343,173	56,801	—9,229	130,381
	6 mos.	2,531	11,397,694	1,109,950	13,606,463	2,193,534	2,367,241	327,392	4,326,764	762,408	10,280,350	75.6	3,326,113	1,594,500	1,040,793	1,581,332
Oregon Wash. R. R. & Nav. Co.	June	2,337	1,372,487	185,258	1,772,501	392,181	256,306	72,709	626,789	125,057	1,487,819	83.9	284,682	100,756	12,108	36,748
	6 mos.	2,337	7,821,872	869,132	9,792,085	2,004,372	1,546,755	433,491	4,035,855	743,800	8,872,537	90.6	919,548	—181,363	—801,769	—117,583
Los Angeles & Salt Lake	June	1,249	1,246,061	359,790	1,768,721	210,644	251,968	75,715	509,850	89,779	1,199,626	67.6	569,095	420,932	314,894	247,766
	6 mos.	1,245	7,480,312	1,487,952	9,851,875	1,758,200	1,638,958	448,333	3,200,812	514,701	7,872,471	79.9	1,979,404	1,098,669	355,343	917,604
St. Joseph & Grand Island	June	258	215,289	4,739	235,519	70,545	33,446	3,475	83,297	18,443	212,823	90.4	22,696	8,870	—17,109	6,920
	6 mos.	258	1,495,340	28,112	1,593,083	352,836	203,559	20,766	512,745	106,370	1,210,484	76.0	382,599	283,863	127,167	245,061
Utah	June	111	48,557	.....	48,858	10,761	24,568	363	13,388	5,761	54,841	112.2	—5,983	—9,890	—22,049	—18,382
	6 mos.	111	585,636	36	588,991	83,423	178,127	2,183	143,974	33,450	440,201	74.7	148,790	102,735	35,706	58,366
Virginian	June	569	1,057,716	10,804	1,138,673	121,974	218,172	15,591	262,169	32,150	648,823	57.0	489,850	349,850	418,165	465,145
	6 mos.	564	7,036,419	85,678	7,565,493	781,046	1,505,950	92,517	1,699,168	192,089	4,272,473	56.5	3,293,020	2,387,952	2,806,198	3,502,639
Wabash	June	2,523	3,698,316	363,999	4,390,482	395,366	805,078	199,757	1,881,298	211,669	3,514,686	80.1	875,796	640,030	203,208	433,650
	6 mos.	2,523	21,751,302	2,088,561	25,772,049	2,053,292	4,579,140	1,140,074	11,592,242	1,325,958	20,813,177	80.8	4,958,872	3,741,066	1,365,106	3,341,078
Ann Arbor	June	293	304,774	6,060	323,176	42,796	72,514	15,878	154,779	16,417	302,559	93.6	20,617	—2,100	—23,400	46,719
	6 mos.	293	2,025,864	34,180	2,122,876	173,041	415,175	90,085	985,234	104,559	1,768,235	83.3	354,641	221,756	78,972	229,896
Western Maryland	June	891	1,143,168	9,771	1,240,010	171,581	254,840	45,503	323,110	40,530	838,365	67.6	401,645	326,645	331,050	378,749
	6 mos.	894	7,233,333	56,871	7,622,585	1,085,980	1,343,777	268,195	2,099,665	251,540	5,068,655	66.5	2,553,930	2,103,930	2,136,886	2,640,195
Western Pacific	June	1,051	831,163	93,198	1,007,872	245,681	126,004	72,017	438,029	46,649	943,465	93.6	64,407	—26,746	—5,266	101,713
	6 mos.	1,051	5,115,908	367,194	5,961,297	1,285,977	1,239,987	418,177	2,711,652	294,465	6,051,090	101.5	—89,793	—646,777	—562,616	—478,185
Wheeling & Lake Erie	June	511	908,606	8,227	980,432	146,080	233,594	36,040	331,881	42,763	791,340	80.7	189,092	89,572	92,943	438,213
	6 mos.	511	5,591,166	60,600	5,990,820	688,744	1,650,784	209,912	1,992,326	243,684	4,791,753	80.0	1,199,067	587,318	563,070	1,888,859
Wichita Falls & Southern	June	203	57,124	77	59,817	11,936	8,007	2,385	17,110	3,288	42,326	70.76	17,491	13,285	9,322	12,457
	6 mos.	203	295,480	608	306,508	63,439	52,020	14,866	109,688	21,898	259,312	84.60	47,196	20,757	—2,900	63,761



100% Reserve Strength *for Emergencies* — with the UNIT SAFETY BAR

• IT isn't often that a draw-bar breaks, but when engine and tender do separate, due to this cause, the consequences can prove costly.

• Full protection against such a possibility is provided by the Unit Safety Bar. An upper draw-bar, made to A. R. A. fibre stress standards, ordinarily carries the full load.

• A second or standby bar equal in strength lies just beneath the draw-bar. It carries no part of the load. Centered about the same draw-bar pins, it remains idle until an emergency calls it into action. If, through fatigue, the draw-bar breaks or stretches, this reserve draw-bar of 100% strength capably takes over the load, providing thorough protection to engine, tender and connections.

• The Unit Safety Bar is reasonable in cost, readily inspected, easy to maintain and requires no lubrication.

THE FRANKLIN SLEEVE JOINT assures a full area opening and unrestricted passage for air, steam and oil.

FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK CHICAGO ST. LOUIS
SAN FRANCISCO MONTREAL

NEWS

(Continued from page 219)

ment. There was also the question of unemployment.

He said railway rates in Canada were 12 per cent lower than in the United States, although that country had double the population per mile of railway than there was in Canada. The Railway Commission controlled rates in Canada, but there might be a point reached where there might have to be a rate revision. During the past 12 months both railways had co-operated to assist in solving the unemployment problem. He thought Governments had gone too far in purchasing scrap railways and adding them to the Canadian National. Greater care should be taken in both building and purchasing railways.

Fair Deal for Railways Urged by Congressman

(Continued from page 216)

of its opening in 1914, notwithstanding the fact that, as the largest taxpayers in the Nation, they have been the principal contributors to its construction and maintenance.

"There is no reason why the railroads should not be free to use the canal, or the inland waterways, upon the same terms as citizens generally. Amendment of the Panama Canal Act, which is urgently needed, would not only give the railroads the right to use that waterway, but would restore to them the rights which the Act also took away from them to participate in intercoastal shipping and in shipping on the Great Lakes.

"It is interesting to look into the future, and 20 years ahead is by no means too far to look when considering policies with reference to matters so important as transportation. It may be assumed that three major developments will be involved in this period:

"(a) The actual carrying out of consolidations of the railroads as contemplated under the Transportation Act of 1920. While the public interest urgently requires this be done, it is most important to realize that enactment of supplementary legislation is necessary to enable it to be brought about effectiveiy. * * * * Therefore, such further legislation as may be required, beyond that contained in the Transportation Act, should be properly considered and enacted by Congress.

"(b) Co-ordination between the various forms of transportation, together with the enactment of legislatiton essential to permit the bringing of this about. This matter has partly been touched upon. Removal of the restrictions of the Panama Canal Act and of the Denison Act would give the railroads again the freedom of the seas, the Great Lakes and the internal waterways. They need no legislation to engage in foreign ocean shipping, and some of our most progressive companies are already doing so with results which will no doubt be beneficial. There is no reason at all why, if it is a good policy for a great railroad to join in an enterprise having for its purpose the carrying of passengers and freight across the ocean to alien soil, it would not be equally good policy to engage in enterprises having for their purpose the carrying of passengers and freight from port to port and city to city within our national boundaries.

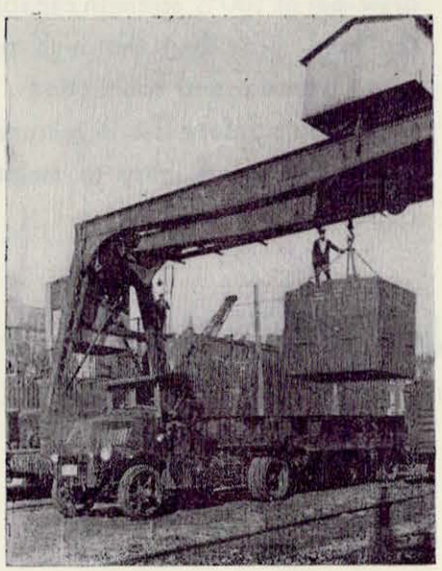
"The rights now enjoyed, and increasingly availed of, by the railroads, to participate in highway and airway transport should not only be carefully safeguarded, but enlarged and amplified, as necessity and the growth of these supplementary services may require. Similarly, there is much justification for saying that the railroads should be given the right to engage in pipe line transportation if in the future it should seem desirable to include that form of service within the scope of their activities.

"The railroads of tomorrow will be well-integrated, rounded-out enterprises, ready to serve the public with any means of transportation for which there is a real demand, and which can be rendered upon a sound economic basis. This covers not only service by the rails, but also on the highways, the seas, the Great Lakes, the inland waterways and in the air. Congress and the State Legislatures will best serve the public by facilitating this natural process of co-ordinating our newer forms of transport around the railroads as a nucleus.

"(c) A third step will be the internal reorganization of the railroads to equip them for properly performing the functions of general carriers. We may, for instance, look forward to the time when on the staff of a division superintendent there will not only be a trainmaster supervising the operations of trains, but also a road-master supervising the operation of buses and trucks, a boat or ship master supervising the operations of water transportation, and an air-master supervising the operation of the air transport enterprises in which the railroad employing him is engaged.

"There seems no reason to think that this is merely a fanciful picture or an extravagant vision of the future. It appears to be merely the logical development of railroads into general carriers, meeting every need of transportation."

* * *



Equipment and Supplies

LOCOMOTIVES

THE AMTORG TRADING CORPORATION is inquiring for one or more 0-4-0 tank locomotives and one or more 0-6-0 tank locomotives.

THE LEHIGH VALLEY has ordered two gas-electric locomotives from the Electro-Motive Company; two oil-electric locomotives from the American Locomotive Company; and one oil-electric locomotive from the Ingersoll-Rand Company.

FREIGHT CARS

THE CHICAGO & NORTH WESTERN plans to sell 9,000 miscellaneous freight cars as scrap. A portion of the cars have already been sold on condition that the dismantling contractor employ Chicago & North Western men who are out of work.

THE CARNEGIE STEEL COMPANY has placed a contract for repairs to 30 hopper cars and has placed an order for 30 new bodies for hopper cars, with the Greenville Steel Car Company. In the *Railway Age* of August 1 it was reported that prices had been received for this equipment.

SIGNALING

THE HUDSON & MANHATTAN has contracted with the General Railway Signal Company to install an electric interlocking at Hoboken, N. J.; 48 levers.

THE BALTIMORE & OHIO has ordered from the General Railway Signal Company a central traffic control machine, and other apparatus for the line between Maynard, Ohio and Fairport, 4½ miles.

THE DENVER & RIO GRANDE WESTERN has ordered from the General Railway Signal Company apparatus for installing automatic block signals on its line between Swallows, Colo. and Pueblo, 15 miles.

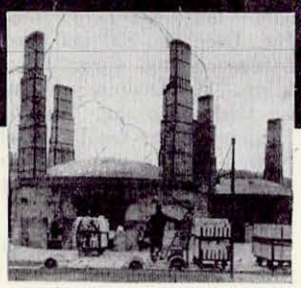
THE LOUISVILLE & NASHVILLE has ordered from the General Railway Signal Company apparatus for centralized traffic control at Montfort, Tenn., and at Strawberry Tower, Ky. Both of these machines have the new desk type control with a full equipment of indicators.

THE DAYTON & UNION has ordered from the General Railway Signal Company apparatus for an interlocking at Dayton (Ohio) Terminal; central traffic control type; 45 levers to control 68 functions. There will be 70 push buttons to operate 72 position-light signals.

Milwaukee and Rock Island Joint Lines

Orders have been placed with the Union Switch & Signal Company by the Chicago, Milwaukee, St. Paul & Pacific, and the Chicago, Rock Island & Pacific for the

Continued on Next Left Hand Page



These Brick are Stable

A LOCOMOTIVE ARCH may stand up in the roundhouse but will it also stand up on the road? Brick design holds part of the answer.

From its 21 years of experience with locomotive Arch Brick, the American Arch Company has worked out special designs of Arch Brick that insure a stable Arch at all times.

The "Bevelled End" permits the use of one size of brick in spite of variations of an inch in Arch tube spacing. The old double socket brick required precise Arch Brick spacing or fallen brick resulted.

Without chipping or fitting of the brick, the "Sled-Runner" end gives a stable, three-point support.

Place such a brick between an Arch tube and the side sheet, and it automatically fits into place—without labor or loss of material.

From its practical knowledge of railroading, the American Arch Company has developed its Security Sectional Arch Brick to fit railroad requirements.

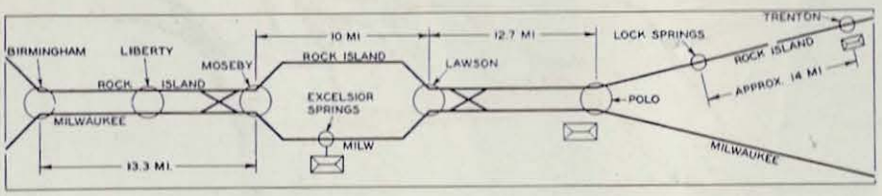
HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists » » »

materials necessary to install two centralized traffic control systems: one for the territory between Trenton, Mo. and Lock Springs, 14 miles, and one for the territory between Polo, Mo. and Birmingham.

From Moseby to Birmingham, 13.3 miles, the lines of the two roads, each single track, lie side by side, and they will be operated jointly as a double-track line. From Lawson to Polo, 12.7 miles they also run side by side, the intervening sections (about 10 miles) being operated separately.

Between Moseby and Birmingham, each road will install automatic block signals,



Centralized Traffic Control in Northwest Missouri

of the searchlight type, arranged normally for left hand running, but with traffic locking to permit running in either direction on either track. At Moseby there will be interlocking, operated by a centralized traffic control machine. Between Moseby and Lawson, 10 miles, the Milwaukee will have the A. P. B. block system, the signals being of the searchlight type. These centralized traffic control interlockings, at Moseby and at Lawson, will be operated from the station at Excelsior Springs, which is midway between the two points.

At Polo there will be a direct-wire electric interlocking, controlling three crossovers and three turnouts. This machine will be in the station at Polo.

Centralized traffic control apparatus will also be used for the switches and signals at Trenton and at Lock Springs, all to be operated from Trenton.

IRON & STEEL

THE ERIE has ordered 500 tons of steel for a bridge at Hillburn, N. Y. from the American Bridge Company.

THE TEXAS & PACIFIC has ordered 2,500 tons of rails and 500 tons of tie plates and fastenings from the Colorado Fuel & Iron Company.

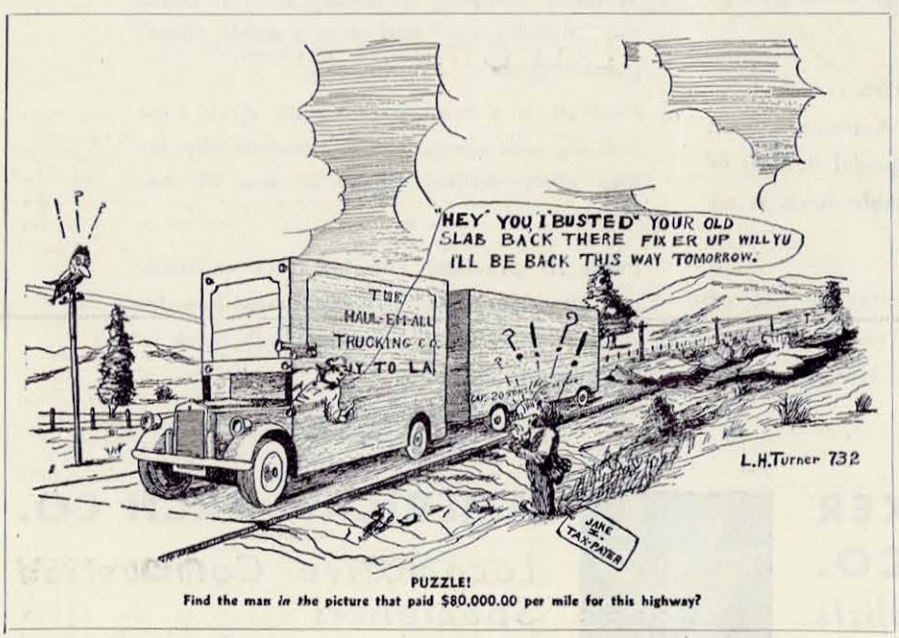
THE NORTHERN PACIFIC has ordered 800 tons of structural steel for a bridge at Seattle, Wash., from the Wallace Bridge & Structural Co.

THE PENNSYLVANIA has ordered 200 tons of steel for a bridge at Lancaster, Pa., from the American Bridge Company, and 500 tons for three bridges from the McClintic-Marshall Corporation.

THE PERE MARQUETTE has ordered 1,200 tons of structural steel for track elevation work at Dearborn, Mich., and 1,150 tons for two bridges at Marquette, Mich., from the American Bridge Company.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon August 15 for 7,500 tons of structural steel to be used in connection with its grade-crossing elimination work on the west side of New York City between St. John's Park and Thirtieth street.

* * * *


"HEY YOU I BUSTED" YOUR OLD SLAB BACK THERE FIX ER UP WILL YU ILL BE BACK THIS WAY TOMORROW.
THE HAUL-EM-ALL TRUCKING CO.
L.H.Turner 732
JANE TAX-PAYER

PUZZLE!
Find the man *in* the picture that paid $80,000.00 per mile for this highway?

From The Railroad Trainman

Supply Trade

The Armspear Manufacturing Company has moved its headquarters from 447 West Fifty-third street to 250 West Fifty-fourth street, New York.

The Logan Iron & Steel Company has moved its office to the Broad Street Station building Sixteenth street and Pennsylvania boulevard, Philadelphia, Pa.

The Ohio Brass Company, Mansfield, Ohio, has moved its Cleveland office from the Union Trust building, to 540 Terminal Tower.

L. S. Hamaker, advertising manager of the **Republic Steel Corporation,** has been appointed manager of sales promotion, with headquarters at Youngstown, Ohio.

Walter A. Deems, for several years in the machine tool department of Manning, Maxwell & Moore, Inc., has opened an office under the name of **Walter A. Deems & Company,** at 143 Liberty street, New York, as manufacturers agent. He now represents the Edna Brass Manufacturing Company, Cincinnati, Ohio; the L. J. Bordo Company, Inc., Glenside, Pa., and the B. F. Nelson Manufacturing Company, Minneapolis, Minn. Mr. Deems, previous to his service with Manning, Maxwell & Moore, Inc., served as master mechanic on the New York Central and later as master mechanic on several divisions of the Baltimore & Ohio.

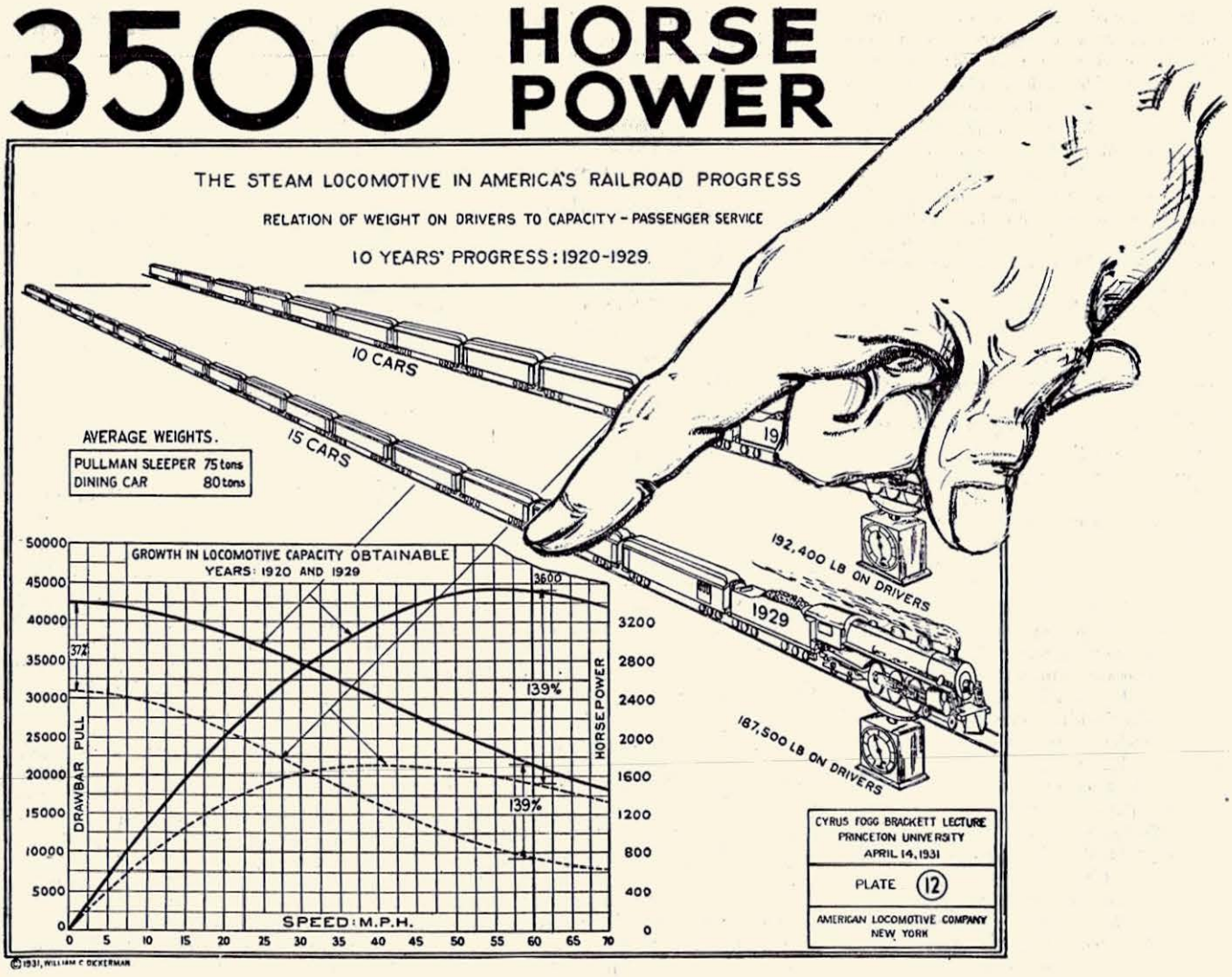
Charles P. Whitehead, who has been promoted to manager of sales of the **General Steel Castings Corporation** with headquarters at Eddystone, Pa., was graduated from the Culver Military Academy, Culver, Ind., in 1917, and served during the World War in the Naval Reserve Flying Corps, until

Charles P. Whitehead

1919. After a few months with the Missouri-Kansas-Texas, he entered the employ of the Commonwealth Steel Company on July 1, 1919, and spent several years in the engineering department and also in the different depart-

Continued on Next Left Hand Page

3500 HORSE POWER



To Economize Modernize

More Than Twice the Power Capacity of the 10-Year-Old Locomotive—

THINK of it—3500 hp. as against only 1500 hp; 37 per cent more drawbar pull at starting; 139 per cent more drawbar pull at passenger express speed of 60 miles per hour. That shows how vastly superior a 1929 locomotive proved itself over a 1920 locomotive in the same passenger service on the same railroad. Both locomotives are actual cases. The curves in the above graph represent their actual performance, the dotted curves represent the performance of the 1920 locomotive and the solid curves that of the 1929 locomotive.

How did the modern locomotive save money and improve operating efficiency?

The 1929 locomotive now hauls 15 Pullmans instead of 10 at no sacrifice in speed. The longer trains reduced the number of sections on limited trains during times of heavy traffic. Fewer diners are now necessary. Two trains are often combined into one. That reduces costs and increases track capacity. It adds safety for it increases the headway between trains.

Are you capitalizing on the big advantages of the modern locomotive? It pays to modernize. The profits now lost will pay the cost.

American Locomotive Company
30 Church Street New York N.Y.

ments of the plant. He joined the Commonwealth Steel Company's sales department in 1922 and since that time has served the railroads located in the western part of the country. On April 1, 1930, Mr. Whitehead was appointed sales assistant to the vice-president and general manager of the Commonwealth division, Granite City, Ill.

William M. Sheehan, who has been appointed manager of the eastern district sales, of the **General Steel Castings Corporation,** with headquarters at Eddystone, Pa., received his academic educationat St. Andrews school, Roanoke, Va., and later took university extension work and a special course at St. Louis University. He served an apprenticeship as machinist in the Roanoke shops of the Norfolk & Western and in the drawing room of the mechanical engineer's office. He later held positions in the engineering departments of the General Electric Company,

William M. Sheehan

the New York Air Brake Company, and the Keith Car & Manufacturing Co., and, in December, 1913, entered the employ of the Commonwealth Steel Company. He became assistant mechanical engineer on July 1, 1915, and since January 1, 1919, held the position of sales engineer with the Commonwealth and its successor, the General Steel Castings Corporation. On April 1, 1930, he was appointed sales assistant to the vice-president and general manager of the Eastern division at Eddystone, Pa.

Harry R. Bartell, who has been promoted to manager of the western district sales, of the **General Steel Castings Corporation,** with headquarters at Granite City, Ill., began his business career in the mechanical engineer's office of the New York Central lines at Cleveland, Ohio, in 1909 and, in 1913, he was transferred to the Collinwood shops' office. He resigned this position in 1915 to accept an appointment as car designer for the Atlas Car & Manufacturing Co., Cleveland, Ohio, and came to the Commonwealth Steel Company in 1916 as chief estimator at the plant in Granite City, Ill. In 1917, he was transferred to the general office as assistant to the chief mechanical engineer, was appointed assistant mechanical engineer in 1920, and mechanical engineer in 1922. Since 1924, he has been a sales

Harry R. Bartell

engineer, continuing in the same position since the Commonwealth Steel Company was merged with the General Steel Castings Corporation.

OBITUARY

H. Otto Wittpenn, president of the Ardco Manufacturing Company, Hoboken, N. J., died at his home in that city on July 25. Mr. Wittpenn was born on October 21, 1872, at Jersey City, N. J., and was educated in the public schools of that city and schools in Germany. At the time of his death, Mr. Wittpenn was a director of the Morris & Essex Railroad Company and president or a

H. Otto Wittpenn

director of several industrial and financial organizations. He had taken an active part in civic affairs, having served as mayor of Jersey City for three terms, and for two terms was comptroller of the Port of New York, under appointment of President Woodrow Wilson. He also served as New Jersey state highway commissioner from 1929 until the time of his death.

Construction

ATLANTA, BIRMINGHAM & COAST.—The Alabama Public Service Commission, on July 30, granted this company authority to discontinue its use of the passenger station of the Louisville & Nashville at Birmingham, Ala., on condition that before discontinuing its service it must erect a passenger station at Elyton not earlier than August 5 nor later than November 5, 1931. Plans of the proposed station at Elyton have been approved by the commission.

BUFFALO, ROCHESTER & PITTSBURGH.—Specifications and an estimate of cost amounting to $229,955, exclusive of land and property damage, for the elimination of the West Main street grade crossing of this company's tracks in LeRoy, N. Y., have been approved by the New York Public Service Commission. The Commission has also approved as not excessive the bid of $49,770, submitted by Ansel A. Howard of Warsaw, N. Y., for work in connection with the elimination of the Loveland road crossing of this railway, located on the Orchard Park-Griffin Mills county highway in Aurora, N. Y.

COLUMBUS & GREENVILLE.—This company has awarded a contract for a bridge over the Yazoo river at Greenwood, Miss., to the Virginia Bridge & Iron Co. Falsework and alterations of piers of the existing bridge will be done by company forces. The bridge consists of two 105 ft. fixed spans and one 286 ft. swing span.

DELAWARE, LACKAWANNA & WESTERN.—An estimate of $14,400 for work in connection with the elimination of the East Mill road crossing of this road in Bethany, N. Y., has been approved by the Public Service Commission of New York.

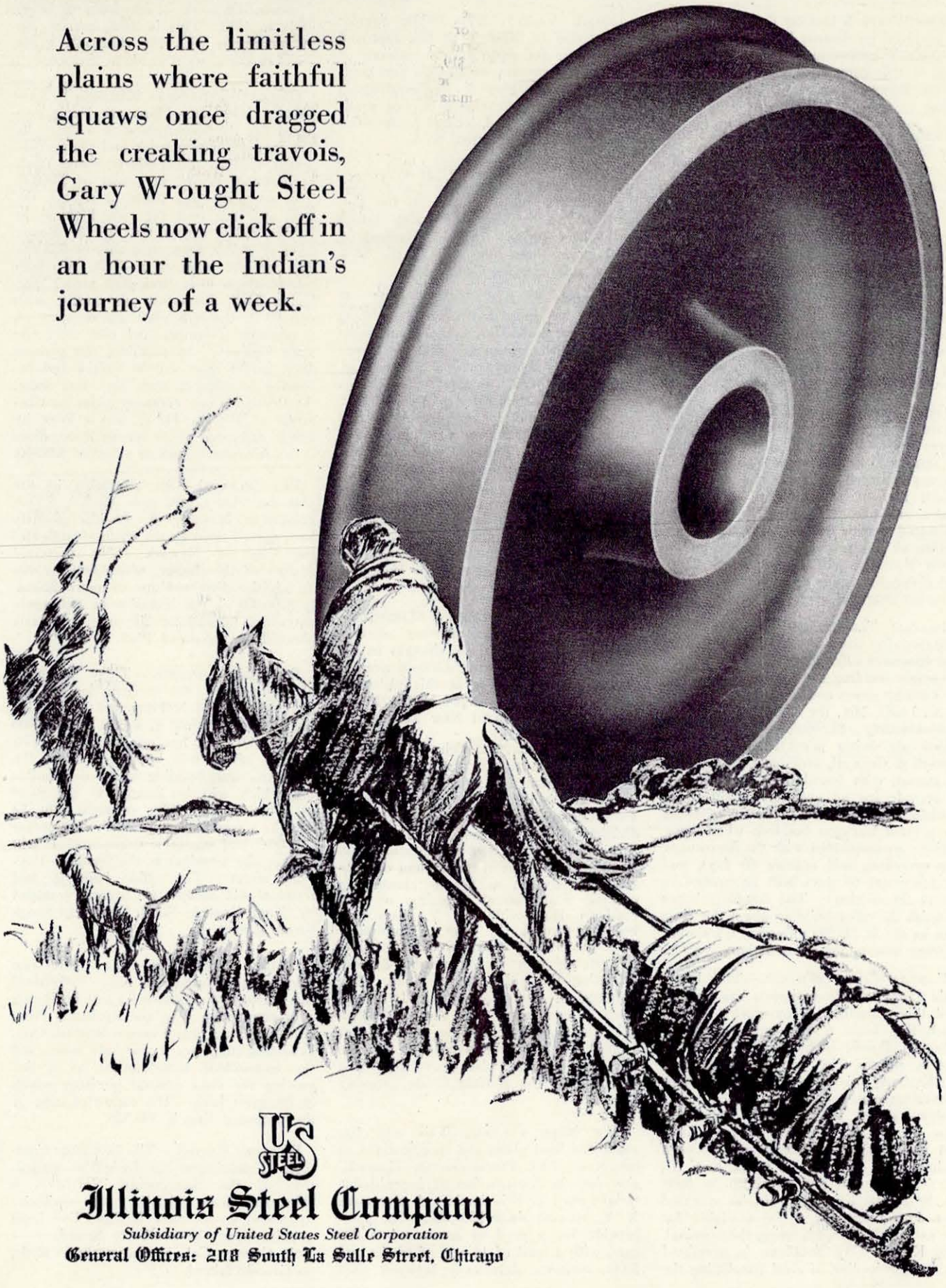
DELAWARE & HUDSON.—A bid of $71,756.91 submitted by F. H. Clement & Company, Bethlehem, Pa., for work in connection with the elimination of the Maple street crossing of this road at Afton, N. Y., has been approved by the New York Public Service Commission. The Commission has also approved the cost estimates and specifications for the elimination of the Wing crossing of the D. & H., 2½ miles south of Plattsburg, N. Y.

ERIE.—The Public Service Commission of New York has approved specifications and estimates of cost for the elimination of grade crossings of this company's line at Main, Washington and Steuben streets, Hornell, N. Y. The Commission has also approved as not excessive the bid of $97,536.75, submitted by Senior & Palmer, New York City, for work in connection with the elimination of a grade crossing of this company's track on the Suffern-Hillburn state highway, Hillburn, N. Y.; and has also designated for elimination the Fairmount avenue crossing in Jamestown, N. Y. This latter will be eliminated by the construction of an overcrossing over the railroad from Fairmount avenue at West Sixth street to Fairmount avenue

Continued on Next Left Hand Page

Hours or Weeks

Across the limitless plains where faithful squaws once dragged the creaking travois, Gary Wrought Steel Wheels now click off in an hour the Indian's journey of a week.



U S STEEL

Illinois Steel Company

Subsidiary of United States Steel Corporation

General Offices: 208 South La Salle Street, Chicago

at Livingston avenue, and the construction of a pedestrian subway at the crossing; the estimated cost of the elimination is approximately $197,700.

Fort Worth & Denver City.—Bids will be received on August 11 for all work to be done in connection with the construction of this company's proposed line between Pampa, Tex., and Childress, 110 miles.

Genesee & Wyoming.—The Public Service Commission of New York has approved as not excessive a bid of $28,258 submitted by Clarence A. Foote & Son, Mt. Morris, N. Y., for the reconstruction of the bridge carrying the Pavilion-Piffard county highway over this company's tracks in York, N. Y.

Great Northern.—The Interstate Commerce Commission has authorized this company to construct and operate a line from Bend, Ore., southward to a point near Lava, 14.3 miles. A contract covering the construction of this line has been awarded to the Hauser Construction Co.

Great Northern.—A contract has been awarded to the Morrison-Knudson Company, Boise, Idaho, for the enlargement to standard dimensions of four tunnels on the Kalispell division, one at Belton, Mont. two in the vicinity of Leonia, Idaho, and one at Camden, Wash., at an estimated cost of $60,000. With the completion of this project, all tunnels on the Great Northern will be of current standard dimensions, thus removing all restrictions on clearance.

Illinois Terminal.—Plans are being prepared for the erection of an 11-story and basement office building and railroad passenger building at the northeast corner of Twelfth street and Washington avenue in St. Louis, Mo., the complete cost being approximately $1,500,000. The plans, which are being prepared by Mauron, Russell & Crowell, architects, provide for 11 stories, with foundations and footings to provide for an eventual height of 20 stories. It is planned to begin wrecking the present Carleton building when negotiations are concluded with the fee owners. The wrecking will require 60 days, and an additional 60 days will be needed to put in the footings. The company hopes to finish the office building about the same time as the $5,000,000 universal warehouse building now under construction.

Kansas City Terminal.—The Interstate Commerce Commission has authorized this company to construct a double track line from a connection with the Missouri Pacific near Fourth and Bluff streets, Kansas City, Mo., and extending northeasterly about a mile to another connection with the Missouri Pacific near Holmes street, the Missouri Pacific to lease its two main tracks between Gillis and Fourth streets (four tracks between Holmes and Gillis streets) to the K. C. T., the leased tracks and those to be built by the terminal company to be operated as a four track line to be available for the use of all railroads using the terminal. The Kansas City Southern is permitted to abandon its line of road paralleling the proposed line of the Kansas City Terminal, the K.C.S. to use the terminal line between these points. The estimated cost, excluding land, of the new project is $700,000.

Lehigh Valley.—The Public Service Commission of New York has approved descriptions and maps and an estimate of cost in the amount of $19,350 for lands and easement rights to be acquired in connection with the elimination of grade crossings of this road, located in the town and village of Van Etten, N. Y.

Long Island.—Specifications and an estimate of cost totaling $94,540 in connection with the reconstruction of the railroad bridge carrying the Long Island tracks over Jericho turnpike, Hempstead, N. Y., have been approved by the New York Public Service Commission.

Missouri Pacific.—Examiner M. S. Jameson, has submitted a proposed report to the Interstate Commerce Commission in which he recommends that the Commission deny the application of this company for authority to construct a bridge over the Mississippi river at Baton Rouge, La., and to operate over this bridge and via trackage rights over the Louisiana & Arkansas from Baton Rouge to New Orleans, 85.4 miles. The New Orleans, Texas & Mexico, a Missouri Pacific subsidiary, now reaches Baton Rouge from the West by ferry service across the river and operates under trackage rights between Baton Rouge and New Orleans over the Yazoo & Mississippi Valley, a subsidiary of the Illinois Central.

New York, New Haven & Hartford.—Specifications and an estimate of cost amounting to $51,655 for changes in the highway bridge carrying Lincoln avenue, Mt. Vernon, N. Y., over this railroad's tracks have been approved by the Public Service Commission of New York.

New York Central.—The Public Service Commission of New York has affirmed its previous order providing for the elimination of the Butts crossing of the New York Central, located on the Adirondack division of the railroad, in the town of Brighton, N. Y. Plans, specifications and an estimate of cost in the amount of $32,200 in connection with the elimination of the State street crossing of this road in Harrisville, N. Y., have also been approved by the Commission. At the same time it approved an alternate estimate of cost in the amount $31,400, providing the piling is not done. The Commission has also approved revised plans in connection with the elimination of the Goodyear avenue and Miller avenue crossing of this road in Buffalo, N. Y. The latter plans have also been approved by the Buffalo Grade Crossing Commission.

New York Central.—This road has submitted final plans and specifications to the New York Public Service Commission for the construction of a perishable freight yard in Erie boulevard, Syracuse, N. Y., to cost about $500,000. The plans provide for a yard to accommodate 205 cars, with a total of 16 sets of tracks and 50-ft. concrete driveways between each set. The project also includes a 50,000-gal. water tank with two water columns, a new yard office, section house, track scales and car inspectors' headquarters. Construction work is scheduled to begin early in 1932. This is being carried out in connection with the railroad's grade crossing elimination work at Syracuse.

Oregon Washington Railroad & Navigation Company.—Plans are being prepared for the construction of a 30 ft. by 154 ft. combination brick and frame passenger station, and a 350-ft. house track at Pullman, Wash., at a cost of $48,800. This company also plans to replace the west approach over the state highway at Bridge 288.02 across the Grande Ronde river at Perry, Ore., at a cost of $33,900. The project involves a 37-ft. two-span pile trestle, a 40-ft. deck plate girder span and a 53-ft. four-span pile trestle, with one 80-ft. through plate girder span on a concrete abutment and pier over the state highway. In addition, the present 40-ft. girder span will be altered and relocated to connect with the river span. At Portland, this company plans to construct a 22-ft. by 112-ft. and a 36-ft. by 110-ft. extension to the second floor offices on its Ainsworth dock at a cost of $28,000.

Pennsylvania.—An alteration in the plan for this road's new Market Street station at Newark, N. J., has recently been agreed upon by the Pennsylvania and the City of Newark. The principal feature of the change, which will involve an additional expenditure of approximately $200,000, is the inclusion of two main entrances instead of the one originally planned on Raymond Plaza West.

Southern Pacific.—This company plans to start the construction of an eight-story office building and an adjoining freight terminal at a cost of $750,000 at New Orleans, La., on January 1. The general offices will be moved from the Pan American building to the new building which will be located at the head of Canal street. The terminal will be used as a receiving and distributing center for fruit and vegetable shipments. It will replace the terminal at the head of Poydras street. The office building and terminal will occupy two squares bounded by Canal, Gravier, South Delta and South Front streets.

United Railways.—The Interstate Commerce Commission has authorized this company to construct a line beginning at a connection with the Spokane, Portland & Seattle near Linnton Station, Ore., extending northward one-half mile, and the co-incident abandonment of a line serving the same general territory which is 2.8 miles long. The estimated cost of the proposed line is $43,526.

Western Pacific.—The Interstate Commerce Commission has denied an application of the Sacramento Northern, a Western Pacific subsidiary, for authority to extend its so-called Holland line from a point near the southerly boundary of Yolo County, Cal., southeasterly to Ryde, on Grande Island.

Continued on Next Left Hand Page

TONCAN

▲▲▲▲ will tame bad water

FORMERLY, when bad water went on a rampage, boiler tubes suffered and maintenance mounted high.

Now, thanks to modern metallurgy, there is a way to check the attacks of corrosive waters.

Boiler tubes of Toncan Iron have superior resistance to rust and corrosion. This alloy of refined iron, copper and molybdenum will outlast other boiler tube materials. Service records prove it.

Toncan Iron tubes not only resist corrosion and pitting but they are seamless and can be cold-worked without danger of subsequent fire-cracking.

Toncan Iron tubes are a contribution of modern metallurgy to the reduction of locomotive maintenance.

REG. U. S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

REPUBLIC STEEL
CORPORATION
General Offices: Youngstown, Ohio

Financial

CHESAPEAKE & OHIO.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire and operate the line of railroad of the Blue Jay Lumber Company extending from Beaver Junction, W. Va., southward to Flat Top, 15 miles.

DELAWARE & HUDSON.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that part of its Honesdale branch extending from Racket Brook, 4.1 miles east to Lookout Junction, in Carbondale, Pa., and extending easterly 23.6 miles to Honesdale Junction. This is the original line of the Delaware & Hudson and was at first operated with a series of inclined planes for the purpose of conveying anthracite coal over the mountains to the point of beginning of the old Delaware & Hudson canal. Abandonment of the line is a result of motor competition. Passenger service was discontinued in 1928. Trucks now are handling all classes of freight, including coal.

LAKE DECATUR & EASTERN.—*Operation Not Authorized.*—The Interstate Commerce Commission has denied the application of this company for authority to acquire and operate the railroad of the A. E. Staley Manufacturing Company, Decatur, Ill., consisting of 2.4 miles of main line and 15.3 miles of siding.

MISSOURI & NORTH ARKANSAS.—*Receiver's Certificates.*—The Interstate Commerce Commission has authorized the receiver of this company to issue $700,000 of 6 per cent receiver's certificates to be sold at not less than 98.11, making the cost approximately eight per cent per annum.

MISSOURI PACIFIC.—*Acquisition.*—The Interstate Commerce Commission has authorized the Missouri Pacific to acquire control of the Chester & Mount Vernon by purchase of its capital stock. The line extends from Chester, Ill., northeasterly to Mount Vernon and has a route mileage, including a branch line, of 64.8 miles.

NEW YORK, CHICAGO & ST. LOUIS.—*Omits Dividend.*—The directors of this company have omitted the usual quarterly dividend of $1.50 on both its common and preferred stock.

NORTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from Great Northern Transfer near Hyndman, Mont., easterly to Queen City, and to abandon the operation under trackage rights over the Great Northern between Helena and Great Northern Transfer, a distance of 37.3 miles.

PITTSBURGH & WEST VIRGINIA.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $2,200,000 of short term notes bearing interest, or to be discounted, at not more than 4½ per cent in renewal of an equal amount of maturing notes.

ROCKCASTLE RIVER.—*Abandonment.*—The Interstate Commerce Commission has authorized the abandonment of this entire line of railroad extending from Bond, Ky., southward to a connection with the Louisville & Nashville at Viva, 12.7 miles, and the abandonment by it of operation under trackage rights over the Louisville & Nashville from Viva to East Bernstadt, 2.8 miles.

ST. LOUIS-SOUTHWESTERN.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to pledge $14,601,000 of bonds as collateral security for $9,000,000 of short term notes, which it proposes to issue to meet maturing notes of similar amount.

Average Prices of Stocks and of Bonds

	Aug. 4	Last week	Last year
Average price of 20 representative railway stocks	63.25	67.19	110.37
Average price of 20 representative railway bonds	90.25	91.38	94.78

Dividends Declared

Bangor & Aroostook, Common, $.88, quarterly; Preferred, $1.75, quarterly, both payable October 1 to holders of record August 31.

CHICAGO, SOUTH SHORE & SOUTH BEND, Class A Preferred, $1.62½, quarterly, payable September 1 to holders of record August 15.

New York, Chicago & St. Louis, Common and Preferred dividends omitted

ALUMINUM FENCE.—A booklet entitled "Why Page-Alcoa Fence?" has been published by the Page Fence Association, Chicago, describing the design and advantages of Page protection and ornamental fencing manufactured from Alcoa aluminum.

* * *

The "Daylight"—De Luxe Coach Train of the Southern Pacific

Railway Officers

EXECUTIVE

Effective August 15, the Southern will abolish the position of assistant to vice-president (maintenance of way), and the jurisdiction of the chief engineer will be extended over the maintenance of way department.

FINANCIAL, LEGAL AND ACCOUNTING

Marion B. Pierce has been appointed assistant general counsel of the Erie, as announced in the *Railway Age* of July 11, page 75. Mr. Pierce was erroneously listed as general attorney, his former position, in the sketch of his railway career which appeared in the *Railway Age* of August 1, page 193.

J. J. Ekin, comptroller, and **E. M. Devereux,** treasurer, of the Baltimore & Ohio, with headquarters at Baltimore, Md., have been appointed also to the same positions on the Alton, which was recently acquired by the B. & O. **H. L. Stuntz,** comptroller of the Chicago & Alton, has been appointed assistant comptroller of the Alton, successor to the C. & A., with headquarters as before at Chicago. **J. Williams,** secretary and treasurer of the Chicago & Alton, has been appointed assistant treasurer of the Alton, with headquarters also at Chicago.

As a sequence to the New York Central's taking over by lease, early in 1930, of the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis, with other minor roads, the following changes in its accounting department went into effect August 1. Separate accounting departments heretofore maintained for the leased roads will be merged to some extent with that of the New York Central. The passenger accounting offices, now at New York, Detroit, Mich., and Cincinnati, Ohio, will be centralized in Cincinnati; the freight accounting offices now at Cleveland, Ohio, New York, Detroit and Cincinnati, will be consolidated at Cleveland and Detroit. **G. M. Glazier,** general auditor, has been appointed general auditor revenues, with headquarters as before at New York; **J. C. Wallace,** general auditor of the Big Four, with headquarters at Cincinnati, has been appointed general auditor disbursements, with office at New York; **E. A. Wigren,** secretary of the Detroit Terminal, general auditor of the Michigan Central and auditor of Toronto, Hamilton & Buffalo, has been appointed assistant comptroller, with headquarters as before at Detroit, Mich., and **R. F. Davies,** assistant general auditor of the Big Four has been appointed local auditor of that road, with headquarters at Cincinnati, as before.

Continued on Next Left Hand Page

BETTER FIRES

FIREBAR CORPORATION
CLEVELAND OHIO.

TRAFFIC

John Crossman, assistant foreign freight agent for the Baltimore & Ohio, at Chicago, has been promoted to foreign freight agent at the same point to succeed **A. F. Rolason,** deceased.

J. W. Gaines, office manager in the general passenger offices of the Southern Pacific at Portland, Ore., has been promoted to district passenger agent, with headquarters at Seattle, Wash.

C. S. Evenson, general agent of the Chicago & North Western, with headquarters at New Orleans, La., has been transferred to Denver, Colo., and has been succeeded by **Lester A. Uvaas,** traveling agent, with headquarters at Cincinnati, Ohio.

William E. Kennedy, who has been promoted to assistant freight traffic manager of the Mobile & Ohio, with headquarters at Mobile, Ala., entered railroad service with the Mobile & Birmingham

William E. Kennedy

(now a part of the Southern) in the local office at Mobile, Ala., as an office boy in November, 1888. In April, 1889, he entered the employ of the Mobile & Ohio as a bill clerk at Mobile, and after holding the positions of rate clerk, cashier and chief clerk, was made local freight agent at Mobile in October, 1896. In 1905, he was transferred to Columbus, Miss., and in December, 1916, to Tuscaloosa, Ala. In January, 1918, he was appointed chief clerk to the foreign freight agent at Mobile, and at the close of the war was appointed supervisor of agencies. Upon the return of the railroads to private control, he was made docks manager of the Mobile & Ohio and Southern Railway ocean terminals at Mobile in March, 1920. In November, 1924, he was promoted to foreign freight agent, which position he has held until his recent appointment.

Frank B. Griffin, who has been appointed general passenger agent of the Missouri-Kansas-Texas of Texas, with headquarters at Dallas, Tex., as noted in the *Railway Age* of July 25, has served in the passenger traffic department of the Katy for nearly 23 years. Mr. Griffin was born on August 9, 1890, at Hearne, Tex., and after a high school education, entered the service of the Katy on September 1, 1908, as assistant city passenger and ticket agent at Austin, Tex., being transferred to San Antonio, Tex., on July 22, 1909, and thence to Houston, Tex., on August 1, 1910. On December 18, 1910, Mr. Griffin returned to San Antonio in the same capacity, where he

Frank B. Griffin

was promoted to city ticket agent on January 1, 1912. Two years later Mr. Griffin was transferred to Austin, where he remained until June 1, 1918, when he was promoted to division passenger agent, again at San Antonio. He was further advanced to assistant general passenger agent, with headquarters at Dallas, on October 1, 1930, which position he held until his recent promotion to general passenger agent, effective July 15.

Clyde P. Bowsher, who has been appointed general freight agent on the Missouri-Kansas-Texas, at Kansas City, Mo., has served this road a total of about 31 years. He was born on November 17, 1879, at Millersburg, Ohio, and after attending a business college at Cincinnati, Ohio, entered the service of the Katy in June, 1899, as a stenographer and clerk at Cincinnati. In January, 1901, he was transferred to St. Louis, Mo., but returned to Cincinnati in August, 1904, as traveling freight agent.

Clyde P. Bowsher

In January, 1914, Mr. Bowsher went to Louisville, Ky., as commercial agent, and from June, 1918, to March, 1919, he was engaged in other business. He returned to the Katy in April, 1919, as division freight and passenger agent at Oklahoma City, Okla., being appointed division freight agent at St. Louis a year later. On April 15, 1929, Mr. Bowsher was advanced to general northern agent for the Katy at Chicago, which position he was holding at the time of his recent promotion, effective July 1.

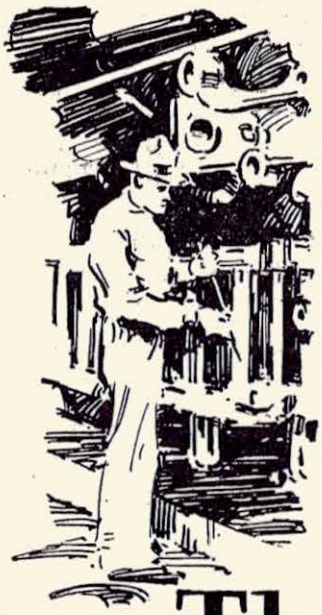
Sidney King, who has been promoted to freight traffic manager of the Wabash, at St. Louis, Mo., has been in the service of this company since 1906, with the exception of a short time during the war when he was in government service. Mr. King was born on December 19, 1885, at Rockwall, Tex., and took three years of college work. His first railway service was with the Missouri Pacific in 1904, but he left this road on March 8, 1906, to become chief clerk for the Wabash at Dallas, Tex. On October 5, 1909, he was appointed traveling freight agent with this road at the same point, where he remained until March 1, 1918, when he left on furlough to enter government service at Washington, D. C., as chief of the traffic section of

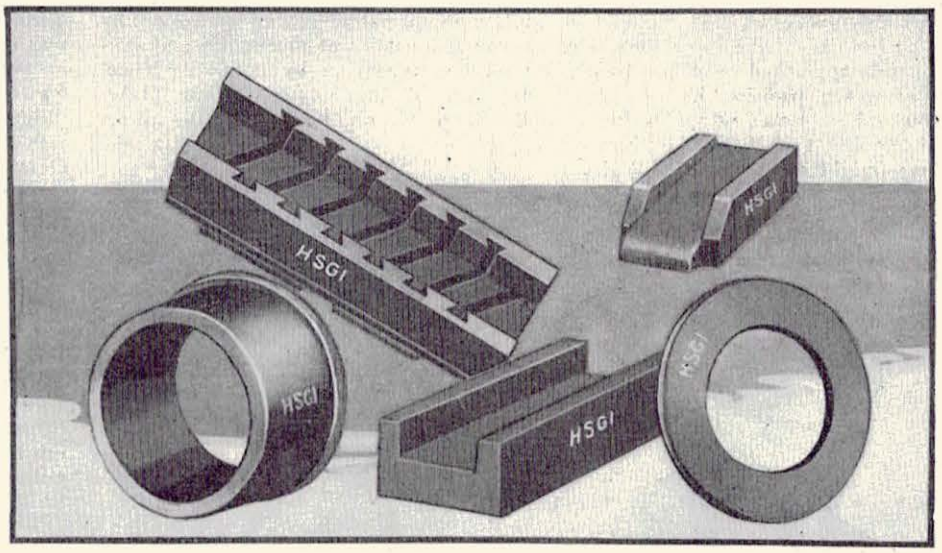
Sidney King

the United States Housing Corporation. On March 1, 1920, Mr. King re-entered the service of the Wabash as traveling freight agent at Dallas, being appointed general agent in the freight department at Houston, Tex., on August 8, 1923. On January 1, 1931, he was promoted to assistant freight traffic manager at St. Louis, Mo., which position he was holding at the time of his advancement to freight traffic manager, Effective July 7.

Philip L. Johnson, who has been appointed assistant freight traffic manager on the Wabash, at St. Louis, Mo., was born on August 10, 1897, at Huntsville, Tex. After attending Sam Houston College at Huntsville for three years, Mr. Johnson joined the United States Navy in 1917. He first entered railway service on April 15, 1921, as a clerk on the Houston Belt & Terminal, and on February 1, 1923, he became assistant chief clerk to the district freight agent of the

Continued on Next Left Hand Page





The Foundation
of Better Performance

APPLICATION of HUNT-SPILLER *Air Furnace* GUN IRON Crosshead Shoes, Outer Rod Bushings, Pedestal Shoes and Wedges is a reliable foundation for dependable performance and assists in eliminating pounds which develop in crossheads, rod bearings and driving boxes. The stress created by these titanic blows are directly responsible for many expensive failures and high repair costs. The quality of the wearing parts is a very important factor.

The resistance of HUNT-SPILLER *Air Furnace* GUN IRON to frictional wear and shock insures greater mileage between renewals, minimum roundhouse attention, and a big savings in maintenance costs.

HSGI
Reg. U. S. Trade Mark

Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished for Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J. G. Platt, Pres. & Gen. Mgr. V. W. Ellet, Vice-President.

Office & Works
383 Dorchester Ave. South Boston, 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER GUN IRON
Air Furnace

Missouri-Kansas-Texas, at Houston, Tex. On June 15 of the same year, Mr. Johnson was appointed soliciting freight agent, in which position he served at Houston and St. Louis, Mo. On March 1, 1924, he left the M-K-T to become traveling freight agent for the Wabash

Philip L. Johnson

at Houston, being advanced to general agent in the freight department at the same point on January 1, 1931. His further promotion to assistant freight traffic manager became effective on July 16.

OPERATING

G. H. Sido, general superintendent of the Ann Arbor, with headquarters at St. Louis, Mo., has been promoted to general manager, with the same headquarters.

Strode P. Henderson, chief operating officer of the Chicago & Alton, has been appointed general manager in charge of maintenance and operation of the Alton, successor to the former company, with headquarters as before at Chicago.

P. H. Nee, superintendent on the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Ottumwa, Ia., has been transferred to Spokane, Wash., where he succeeds **D. E. Rossiter,** who has been placed in charge of rules examinations on the Western lines.

R. C. Morrison, superintendent of the Knoxville division of the Louisville & Nashville, with headquarters at Knoxville, Tenn., has had his jurisdiction extended to include the Atlanta division. **S. H. Fulkerson,** assistant superintendent of the Montgomery division, with headquarters at Montgomery, Ala., has been appointed assistant superintendent of the Knoxville and Atlanta divisions.

Perry J. Lynch, who has been appointed superintendent of car service of the Oregon-Washington Railroad & Navigation Co., with headquarters at Portland, Ore., as announced in the *Railway Age* for July 18, has served in the car service department of this road for about 20 years. He was born on February 24, 1896, at Helena, Mont., and following a public school education he continued studies of mechanics and railroad transportation by correspondence. He entered the service of the O.-W. R. R. & N. on July 10, 1910, as an

Perry J. Lynch

office boy in the office of the car service agent, and subsequently occupied every position in this office, including that of junction yard clerk, record clerk, passenger car distributor, assistant chief clerk and chief clerk. He was holding the latter position at the time of his recent promotion, effective July 8. From June, 1917, to December, 1918, Mr. Lynch served in the United States Army, principally at Fort Benjamin Harrison, Ind., where he trained in light railway construction and operation.

ENGINEERING AND SIGNALING

Arthur E. Heimbach, train control supervisor of the Pittsburgh & Lake Erie, with headquarters at Pittsburgh, Pa., has been promoted to assistant signal engineer, with the same headquarters. He was born on December 23, 1902, at Allentown, Pa., and graduated from Pennsylvania State college in 1924.

* * *

On the Pennsylvania, near Landisville, Pa.

From July, 1924, to June 30, 1926, he was engaged in an apprenticeship course in signal engineering with the Union Switch & Signal Company, and from July 1, 1926, to September 30, 1927, he was an engineer for this company. On October 1, 1927, he was appointed train control supervisor of the Pittsburgh & Lake Erie, which position he has held until his recent promotion.

MECHANICAL

G. H. Emerson, chief of motive power and equipment of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been appointed also to the same position on the Alton, which was recently acquired by the B. & O.

SPECIAL

Dr. L. W. Fitzmaurice has been appointed regional medical officer of the Canadian National at Moncton, N. B. Dr. Fitzmaurice was formerly assistant to director of accident prevention at Montreal.

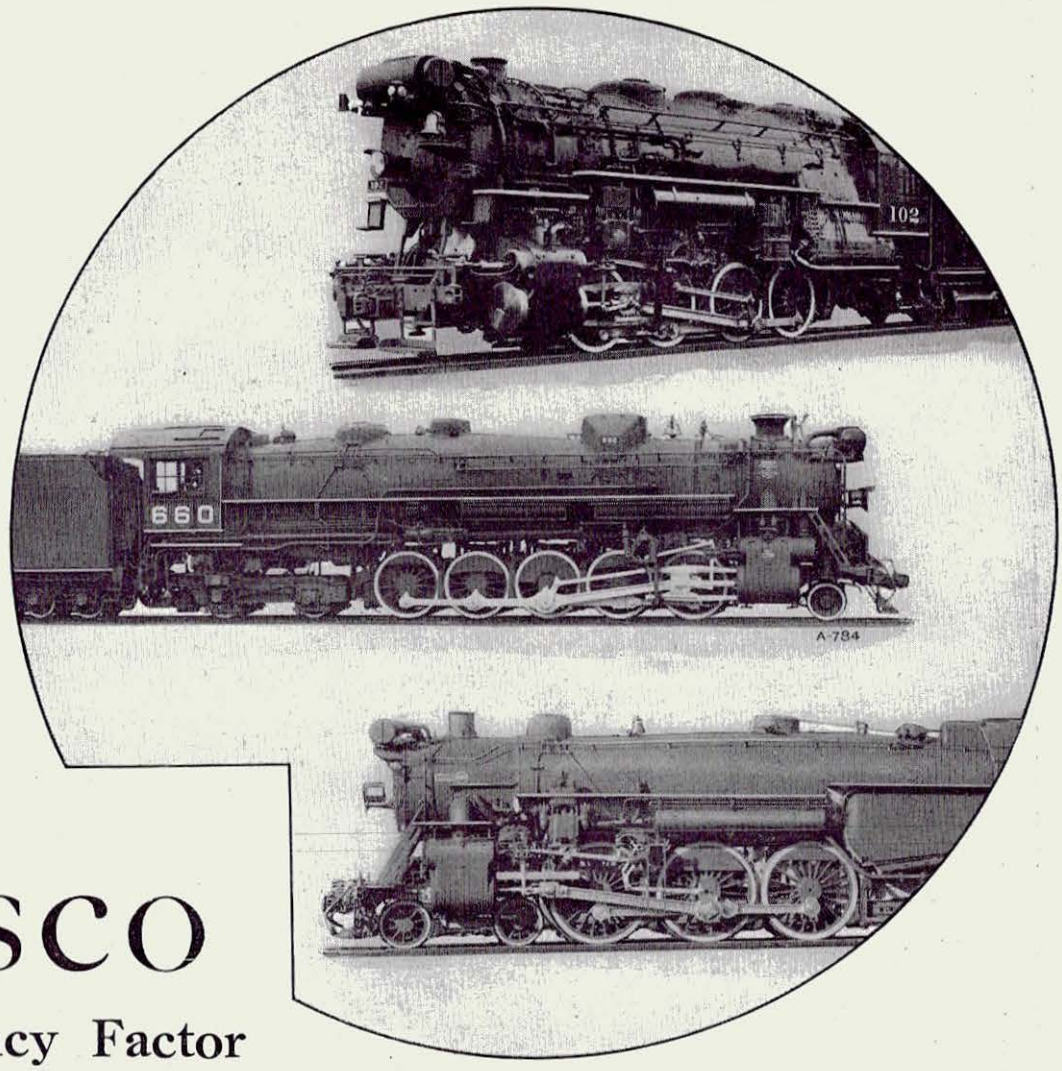
OBITUARY

David Laughlin, assistant auditor of passenger receipts of the Missouri Pacific, with headquarters at St. Louis, Mo., died on July 21.

H. R. Ballard, who retired three years ago as general agent for the New York Central at St. Paul, Minn., died on July 29 at his home at that point.

Frank P. Eyman, who retired in 1920 as freight traffic manager on the Chicago & North Western, with headquarters at Chicago, died at Drexel Hill, Pa., on July 29.

F. W. Kirtland, freight traffic manager of the Florida East Coast, with headquarters at St. Augustine, Fla., died on July 19, at New York City, at the age of 61 years. Mr. Kirtland was born at Montgomery, Ala., on March 15, 1870 and began his railroad career in that city in 1889. Subsequently he accepted a position with the old Plant System at Montgomery, and after holding various clerical positions in the local agency, he went to Savannah, Ga., to become chief clerk in the freight traffic department of the Plant System. When that system was absorbed by the Atlantic Coast Line, Mr. Kirtland continued with the Savannah office, but shortly thereafter returned to Montgomery as freight agent of the Atlantic Coast Line. From that position he was promoted to commercial agent, and after a short time, transferred to Jacksonville, Fla., as division freight agent. In 1908, he left the service of the Atlantic Coast Line, to become assistant general freight agent of the Florida East Coast at St. Augustine, Fla. From that position he was promoted to general freight agent, and later to freight traffic manager in which capacity he also served with the Florida East Coast Car Ferry Company, the positions he held until his death.



Elesco

the Efficiency Factor

When you consider the tonnage and speeds of just a few years ago and compare them with present locomotive performance, the influence of the Elesco superheater on railroad operation is apparent.

Since their inception, Elesco superheaters have been providing that added steaming capacity that enables hauling full tonnage trains at economical speeds. On more than 57,000 American-built locomotives they are daily making possible the train loads and high speeds so necessary today.

THE SUPERHEATER COMPANY

60 East 42nd Street
NEW YORK

ELESCO

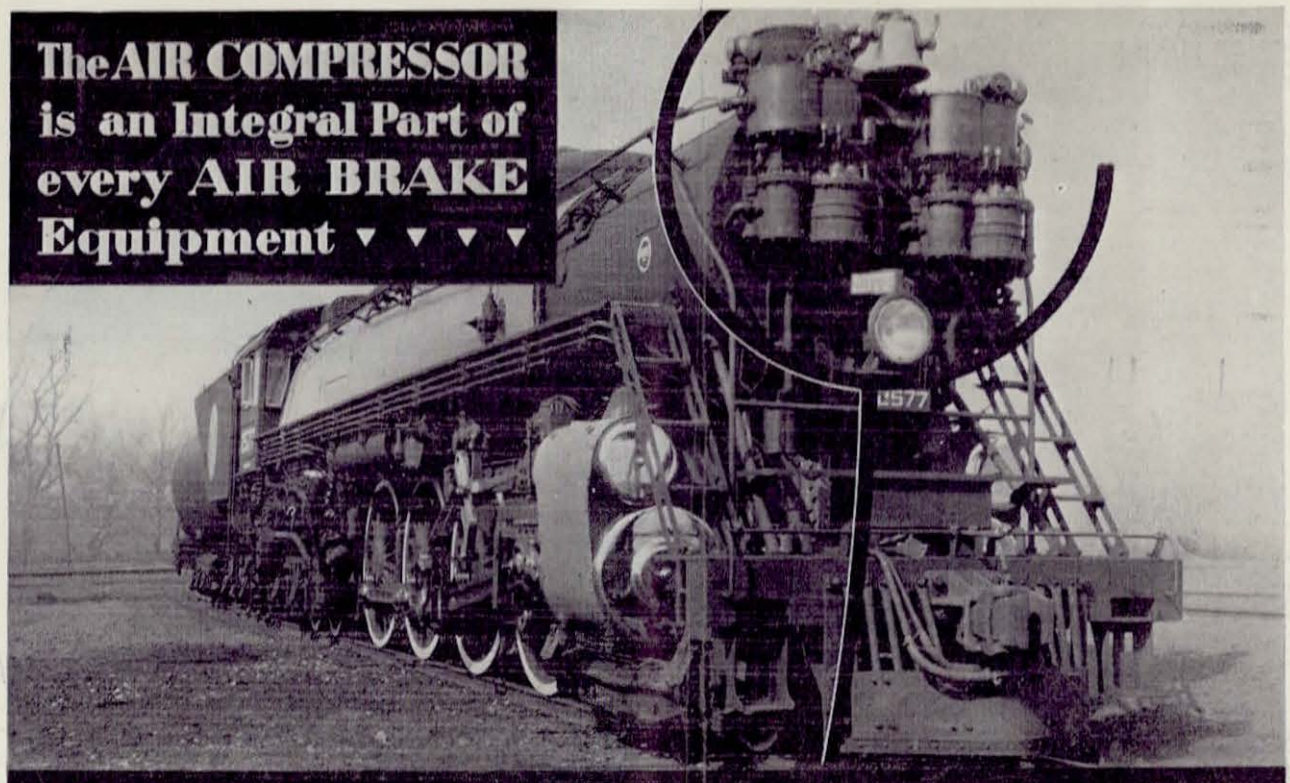
Peoples Gas Building
CHICAGO

Canada: The Superheater Company Limited, Montreal

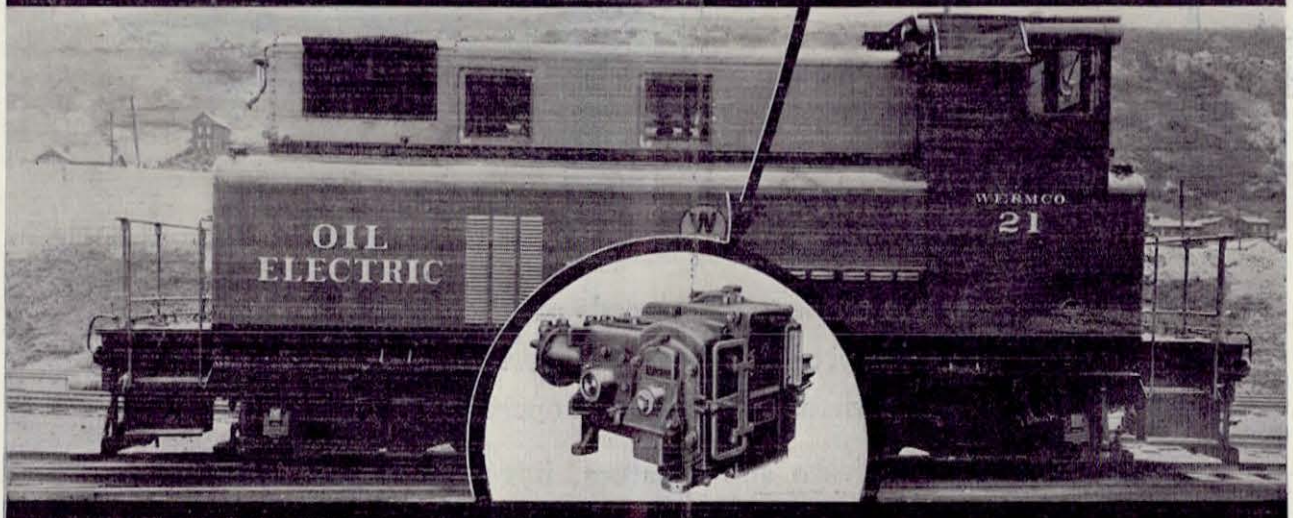
Superheaters *Feed Water Heaters* *Exhaust Steam Injectors* *Superheated Steam Pyrometers*

A-619

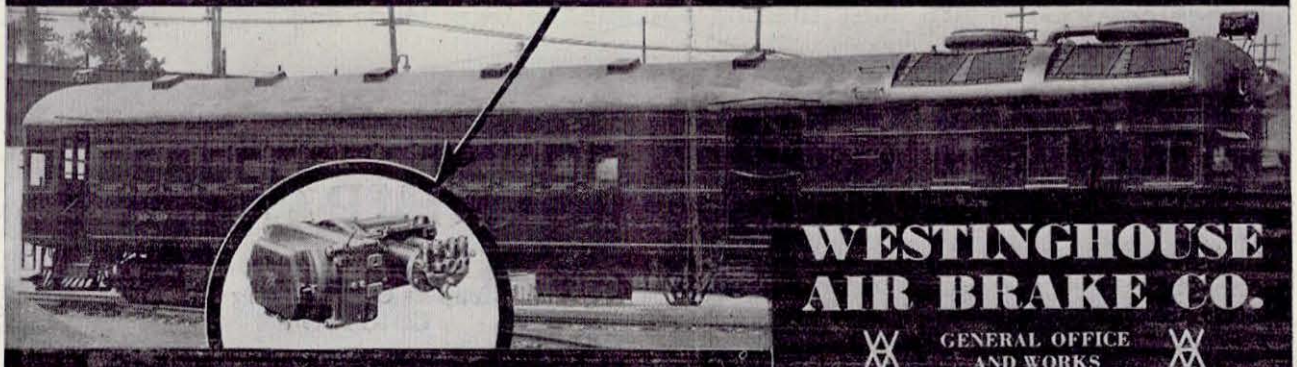
The AIR COMPRESSOR is an Integral Part of every AIR BRAKE Equipment ▼ ▼ ▼ ▼



FOR STEAM LOCOMOTIVES



FOR ELECTRIC LOCOMOTIVES



FOR RAIL MOTOR CARS

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS

WILMERDING, PA.

GOOD, DEPENDABLE WHEELS for fast-freight service

Due to the ever-increasing demands of modern business, faster and longer freight trains have become, not the exception, but the rule. As a result, greater and greater burdens are placed on the wheels.

Small wonder that railroad executives everywhere are more and more laying stress on the importance of good, dependable car wheels!

Bethlehem Light Weight Wrought Steel Wheels meet all the requirements of today's fast-freight service. They are strong, safe, and durable, and are produced for all types of freight cars, up to and including those of 70 tons carrying capacity. They are made by the same process as multiple-wear Bethlehem Wheels but have smaller hubs, and lighter plates and rims than the corresponding wheels of the multiple-wear type.

The long, satisfactory service that they give and their economy and safety, make Bethlehem Light Weight Wrought Steel Wheels the logical wheels for modern fast-freight service. We invite you to make a thorough investigation of their many advantages.

BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Buffalo, Pittsburgh, Cleveland, Cincinnati, Detroit, Chicago, St. Louis

Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco, Los Angeles, Seattle, Portland, Honolulu.

Export Distributor: Bethlehem Steel Export Corporation, 25 Broadway, New York City.

BETHLEHEM
Wrought Steel Wheels

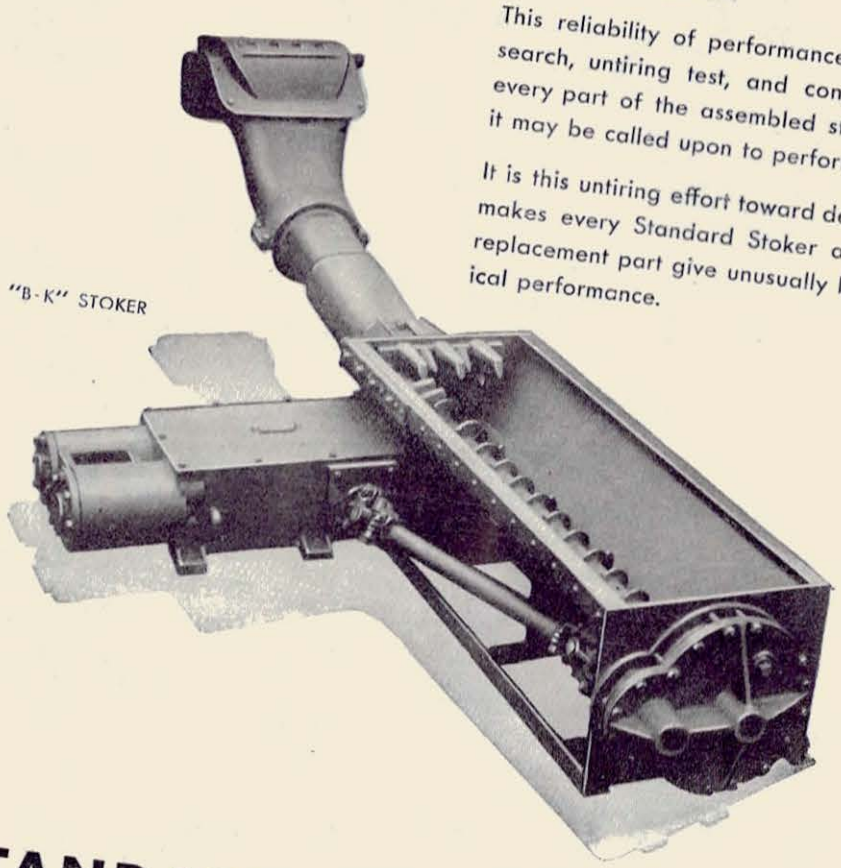
PERFORMANCE Tells An Interesting Story

SURVEY the performance of power fired by the Standard Stoker. Analyze the tonnage hauled, the on time record, and the reliability of performance over long periods.

This reliability of performance is recognized — nearly all power, hauling limited trains, is stoker fired as is all modern, heavy freight power.

This reliability of performance is the result of careful research, untiring test, and constant development to make every part of the assembled stoker adequate for any duty it may be called upon to perform.

It is this untiring effort toward dependable performance that makes every Standard Stoker and every Standard Stoker replacement part give unusually long, dependable, economical performance.



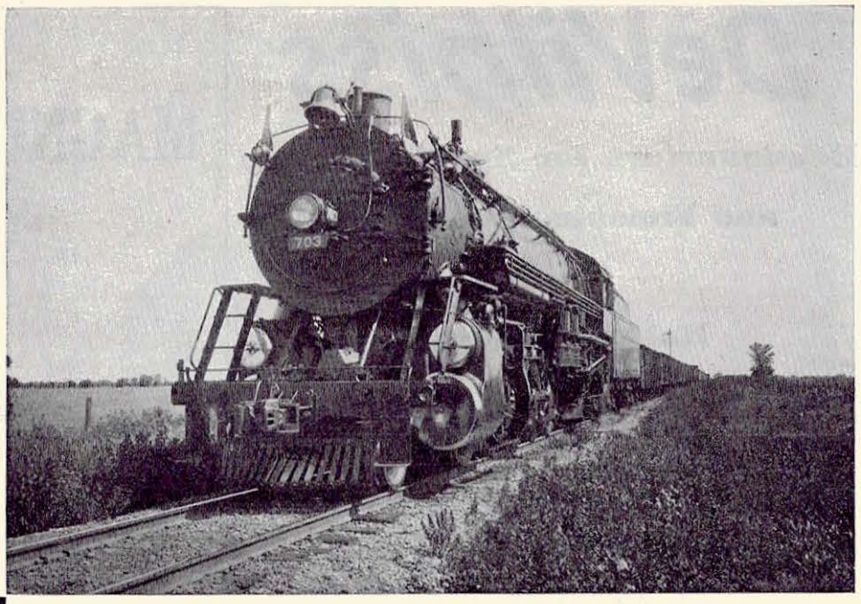
TYPE "B-K" STOKER

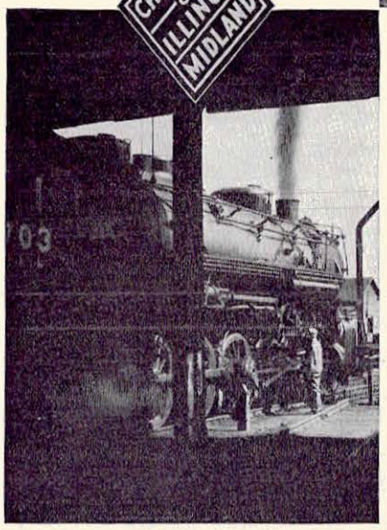
THE STANDARD STOKER COMPANY, Inc.

NEW YORK CHICAGO ERIE

VANCORAM

FERRO-ALLOYS of vanadium, silicon, chromium and titanium; silico-manganese, tungsten and molybdenum, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.





One of the four 2-10-2 type locomotives, equipped with Carbon-Vanadium Steel main rods, side rods and piston rods, recently built by Lima Locomotive Works, Incorporated, for Chicago & Illinois Midland Railway Company.

Carbon-Vanadium Steel

Main Rods, Side Rods and Piston Rods

On New Locomotives For The Chicago & Illinois Midland

LAST November, the Chicago & Illinois Midland Railway Company ordered two 2-10-2 type locomotives from Lima Locomotive Works, Incorporated. Two additional locomotives of the same type were ordered by the railway company from Lima last February. All four locomotives were equipped with Carbon-Vanadium Steel in main rods, side rods and piston rods.

With useful strength fully 50 per cent in excess of that of carbon steel forgings, Carbon-Vanadium Forgings possess equally superior shock-resistance and anti-fatigue qualities. The higher physical properties of Carbon-Vanadium Steel can be employed to provide greater endurance and safety, or to obtain the requisite durability in forgings of smaller section and lighter weight. Savings in weight effected by the use of Carbon-Vanadium Forgings in proper design can be employed to increase boiler size and locomotive efficiency.

Of all alloy steels generally employed in railroad work, Carbon-Vanadium Steel is simplest and easiest to handle. It contains only the one alloying element, and is not quenched and tempered. Normalizing alone is essential to develop the maximum physical properties. Hence, Carbon-Vanadium Forgings are readily handled in the railroad shop equipped for forging work. Complete information will be sent you on request. Write us.

VANADIUM CORPORATION OF AMERICA

120 BROADWAY, NEW YORK, N. Y.

CHICAGO *Straus Bldg.* PITTSBURGH *Oliver Bldg.* DETROIT *Book Tower*

Plants at Bridgeville, Pa., and Niagara Falls, N.Y.
Research and Development Laboratories at Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Logan Iron & Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co.

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts' & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co.

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Baldwin Locomotive Works, The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs; Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety).

Stokers, Locomotive.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Okonite Co., The.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

Testers, Rail.
Sperry Products, Inc.

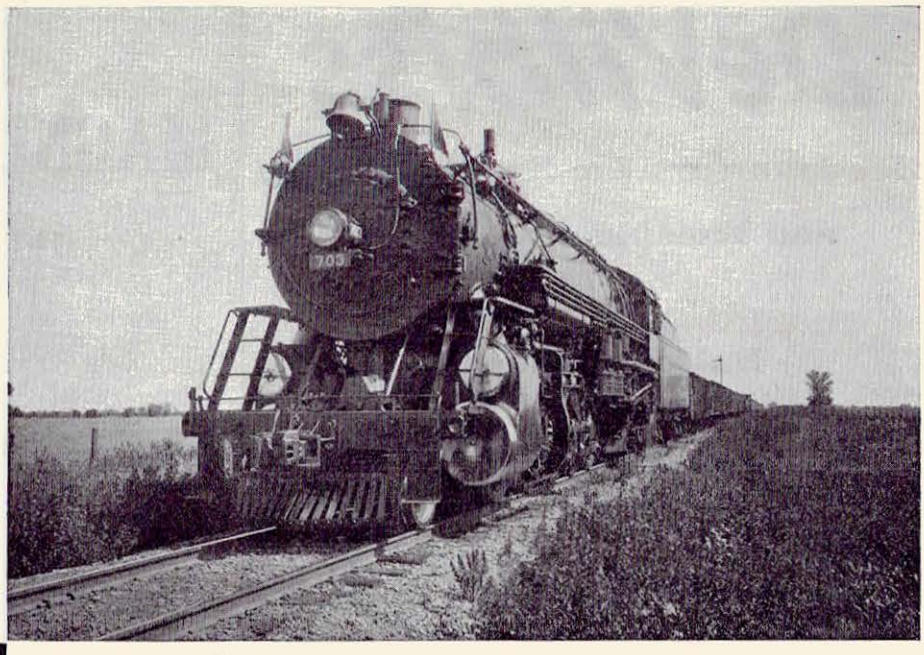
Testers, Staybolt.
Flannery Bolt Co.

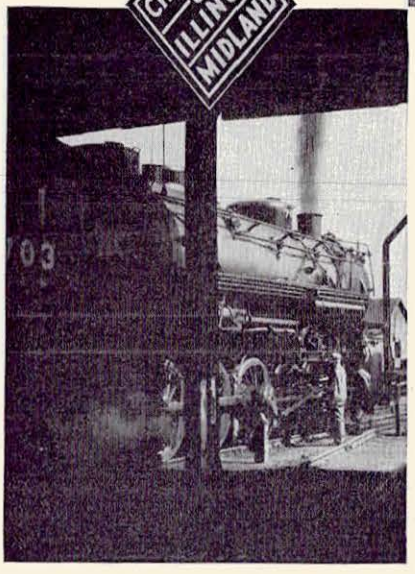
Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.

VANCORAM

FERRO-ALLOYS of vanadium, silicon, chromium and titanium; silico-manganese, tungsten and molybdenum, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.





One of the four 2-10-2 type locomotives, equipped with Carbon-Vanadium Steel main rods, side rods and piston rods, recently built by Lima Locomotive Works, Incorporated, for Chicago & Illinois Midland Railway Company.

Carbon-Vanadium Steel

Main Rods, Side Rods and Piston Rods

On New Locomotives For The Chicago & Illinois Midland

LAST November, the Chicago & Illinois Midland Railway Company ordered two 2-10-2 type locomotives from Lima Locomotive Works, Incorporated. Two additional locomotives of the same type were ordered by the railway company from Lima last February. All four locomotives were equipped with Carbon-Vanadium Steel in main rods, side rods and piston rods.

With useful strength fully 50 per cent in excess of that of carbon steel forgings, Carbon-Vanadium Forgings possess equally superior shock-resistance and anti-fatigue qualities. The higher physical properties of Carbon-Vanadium Steel can be employed to provide greater endurance and safety, or to obtain the requisite durability in forgings of smaller section and lighter weight. Savings in weight effected by the use of Carbon-Vanadium Forgings in proper design can be employed to increase boiler size and locomotive efficiency.

Of all alloy steels generally employed in railroad work, Carbon-Vanadium Steel is simplest and easiest to handle. It contains only the one alloying element, and is not quenched and tempered. Normalizing alone is essential to develop the maximum physical properties. Hence, Carbon-Vanadium Forgings are readily handled in the railroad shop equipped for forging work. Complete information will be sent you on request. Write us.

VANADIUM CORPORATION OF AMERICA

120 BROADWAY, NEW YORK, N. Y.

CHICAGO *Straus Bldg.* PITTSBURGH *Oliver Bldg.* DETROIT *Book Tower*

Plants at Bridgeville, Pa., and Niagara Falls, N.Y.
Research and Development Laboratories at Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

DeVilbiss

Headquarters for Spray-Painting and Finishing Equipment for the Railway Industry

There are many types of DeVilbiss Spray-painting Equipment designed especially to meet the requirements of railroads. This railway equipment is built with the same high quality of workmanship and materials which characterizes all DeVilbiss Equipment.

There is special bridge equipment which operates many paint spray guns but can also be used to operate air driven tools. Another special type is a completely motorized spray-painting outfit, mounted on a hand car and using its power for operation. There are other types and many sizes of DeVilbiss Equipment to meet any need economically and efficiently under conditions of continuous hard service.

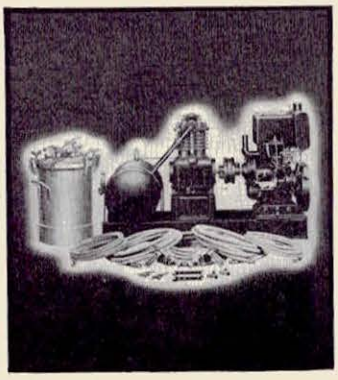
DeVilbiss Equipment includes every outfit, device and accessory for railway spray-painting operations. Call the DeVilbiss sales representative near you. Or write.

THE DEVILBISS COMPANY .. TOLEDO, OHIO

NEW YORK PHILADELPHIA CLEVELAND DETROIT INDIANAPOLIS CHICAGO ST. LOUIS LOS ANGELES SAN FRANCISCO WINDSOR, ONTARIO

Direct sales and service representatives available everywhere

The wide DeVilbiss Line embraces every outfit and accessory for spray-painting and spray-finishing



MAGNUS COMPANY

(INCORPORATED)

Journal Bearings

AND

Bronze Engine Castings

New York Chicago

KERITE
AN INVESTMENT
When you put your money into KERITE you make an investment in service. You do more than buy conductors, insulation and protection. You obtain the best possible combination of the most desirable qualities in permanent form. KERITE remains long after the price is forgotten.
THE KERITE INSULATED WIRE & CABLE COMPANY INC
NEW YORK CHICAGO SAN FRANCISCO

SPEED UP

A foaming engine delays train movement. Prevent foaming and speed up traffic by using "B-A Anti-Foam."

"B-A Anti-Foam" increases the tonnage hauled, reduces terminal delays, improves lubrication and cuts fuel and water consumption. Moreover it gives the engine man the advantage of a better engine to work with.

Consult Bird-Archer. Their water treatment experts are worth while calling upon.

THE BIRD-ARCHER COMPANY

New York Chicago
Philadelphia • • •

The BIRD-ARCHER COMPANY, *Ltd.*, Montreal

Laboratories and Plants at Philadelphia, Chicago and Cobourg, Ont.

WHY IS MANSON TAPE PACKED IN TIN CANS?

BECAUSE long exposure to air makes it set firmly on the splice to form a perfect protection. This is a great advantage. The tin can excludes air while the tape is in stock and keeps it in prime condition for use. Thus the perfect tape is packed in the ideal package.

Each roll is guaranteed for one year.

THE OKONITE COMPANY

Founded 1878
THE OKONITE-CALLENDER CABLE COMPANY, INC.
Factories: Passaic, N. J. Paterson, N. J.
SALES OFFICES:
NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ST. LOUIS
BOSTON ATLANTA SAN FRANCISCO LOS ANGELES SEATTLE DALLAS

BARBER LATERAL-MOTION DEVICE

1,300,000 cars in service on over 60 Railroads and Car Lines

ROLLER SIDE-BEARINGS

Reduces Friction on Rails 15%
Lessens Wheel Flange Wear

STANDARD CAR TRUCK CO.
McCORMICK BUILDING CHICAGO

OHIO LOCOMOTIVE CRANES

ERECTION CRANES · LOGGING CRANES
WHARF, BARGE AND GANTRY CRANES
RAILROAD PILE DRIVERS
CRAWLER CRANES & SHOVELS

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

Fabricated
STRUCTURAL STEEL
for
BRIDGES
and
BUILDINGS
and other classes of
STEEL STRUCTURES
including
TURN-TABLES
(Continuous Type)

Inquiries will receive prompt attention
Additional information on request

AMERICAN BRIDGE COMPANY
Subsidiary of United States Steel Corporation
General Offices—71 Broadway, New York, N. Y.
Offices in Principal Cities

MT. VERNON CAR MFG. CO. MT. VERNON, ILL.

70-Ton All Steel Hopper Car

Builders of
All Kinds of Freight Cars

Annual Capacity { 12,000 Freight Cars; 125,000 { Chilled Tread Wheels; 20,000 Tons Forgings

Individual Shop and Special Facilities for Rebuilding and Repairing Cars

SAFETY
CAR LIGHTING EQUIPMENT

The Safety Car Heating and Lighting Co.

New York Chicago St. Louis Boston
Philadelphia San Francisco Montreal

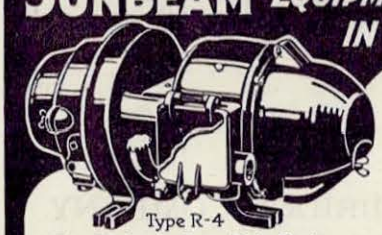
CAMEL & YOUNGSTOWN

Freight Car Door Fixtures

Corrugated Steel Freight Car Doors

CAMEL SALES COMPANY 332 South Michigan Avenue CHICAGO, ILLINOIS

SUNBEAM *Equipment For Safety in Train Control*


Type R-4

The Sunbeam Four-Pole Turbo-Generator has a wave-wound armature and four brushes that insure freedom from voltage ripple. A responsive governor maintains constant speed and voltage

SUNBEAM Train Control Turbo-Generators operate at constant speed, insuring close voltage regulation. Designed especially to meet the critical demands of train control, they effect great economy in steam and maintenance costs. Their performance in actual use demonstrates their reliability over long periods of service. Write for further details.

SUNBEAM ELECTRIC MFG. CO.
NEW YORK SAN FRANCISCO PHILADELPHIA EVANSVILLE, INDIANA, U. S. A. DENVER RICHMOND INDIANAPOLIS

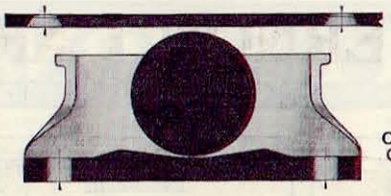
WINE RAILWAY APPLIANCE CO.
TOLEDO, OHIO

Details of our products appear in following issues of Railway Age during 1931

January 3—February 7—March 7—April 4—May 2—June 6—July 4—August 1—September 12—October 10—November 21—December 19

For Classified Advertisements see Get Together Section in this publication

BUFFALO BRAKE BEAM CO.
—BRAKE BEAMS—
AUXILIARY SUPPORTS FOR BRAKE BEAMS
NEW YORK AND BUFFALO



STUCKI SIDE BEARINGS
Manufactured by
A. Stucki Co.
Oliver Bldg., Pittsburgh, Pa
Canadian Representative:
The Holden Co., Ltd.,
Montreal, Can

Ask for details and rates on
Classified Advertising
in this publication

Nichols Transfer Tables
Turntable Tractors
Geo. P. Nichols & Bro. Chicago
2139 Fulton Street

UNION STEEL CASTING COMPANY PITTSBURGH, PA.
Cast Steel Locomotive Cylinders, Carbon and Vanadium Cast Steel Locomotive Frames. Wheel Centers, Crossheads and General Miscellaneous Castings for Locomotive and Car Work.

Staybolt Iron Lewis Special
Solid or Hollow Drilled Staybolts, Lewis Engine Bolt Iron. Also Ryerson Railroad Shop Machinery. Complete stocks of steel for immediate shipment. Write for complete information.
Chicago, Milwaukee, St. Louis, Cincinnati, Cleveland, Detroit, Buffalo, Boston, Philadelphia, Jersey City
Ryerson

OLD STYLE HAND PUDDLED
LOGAN IRON
STAYBOLT — ENGINEBOLT — FORGING IRON
CHAIN — LOGAN IRON & STEEL CO. — RIVET
BURNHAM, PA. PHILADELPHIA, PA.

Western
DUMP CARS
Are Quick Operating
WESTERN WHEELED SCRAPER CO.
Builders of Air Dump Cars
AURORA, ILLINOIS

TIE PLATES
Track Appliances
Highway Crossing Signals
Signal Accessories
THE RAILROAD SUPPLY COMPANY
CHICAGO NEW YORK

Union Spring & Manufacturing Co
Steel Castings, Coil Springs, Spring Plates, Elliptic Springs, Journal Box Lids
Kensington (All Steel) Journal Box
WORKS: New Kensington, Pa.
PITTSBURGH OFFICE: 2001 Clark Building

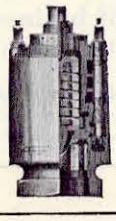
THE "FAIR"
RAIL ANTI-CREEPER
THE P & M. CO.
CHICAGO NEW YORK
Montreal London Paris Calcutta Sydney

A QUALITY PRODUCT
RESULT OF 40 YEARS EXPERIENCE
TUCOLITH
FLEXOLITH
CAR FLOORING
TUCO PRODUCTS CORP.
30 CHURCH STREET, NEW YORK
122 S. MICHIGAN AVE., CHICAGO

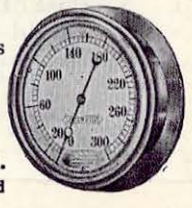
New Journal Box Lid requirements per A.R.A. circular No. A-337-1930 are complied with in ASCO A. R. A. Special Torsion Spring Journal Box Lids.
Allegheny
Allegheny Steel Company, General Offices and Works, Brackenridge, Pa.
New York Buffalo Cleveland Chicago Detroit
Milwaukee St. Louis Los Angeles
Sheets for Automobile Bodies · Metallic Furniture · Deep Draws · Allegheny Metal · Ascoloy · Electrical Sheets · Steel Castings · Better Tubes · Pipe

Hollow Iron Bars up to 14 ft. long—Solid to 18 ft. Hollow or solid Stays, plain, headed, or headed and threaded.

UNARCO
Asbestos and Rubber Packings for Railroad Use. Asbestos Insulating Materials
UNION ASBESTOS & RUBBER CO.
310 South Michigan Ave. Chicago, Ill.



Ashton High Grade
Pop Valves—Steam Gauges
the quality standard for over 50 years.
Exclusive features insuring greatest efficiency and durability.
THE ASHTON VALVE CO.
New York, Boston, Chicago and San Francisco



Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Logan Iron & Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co.

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts' & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co.

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Baldwin Locomotive Works The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety).

Stokers, Locomotive.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Okonite Co., The.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

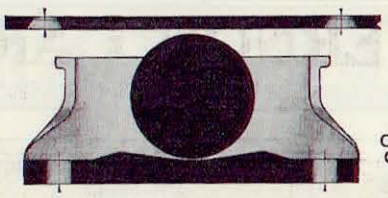
Testers, Rail.
Sperry Products, Inc.

Testers, Staybolt.
Flannery Bolt Co.

Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.

BUFFALO BRAKE BEAM CO.
—BRAKE BEAMS—
AUXILIARY SUPPORTS FOR BRAKE BEAMS
NEW YORK AND BUFFALO



STUCKI SIDE BEARINGS
Manufactured by
A. Stucki Co.
Oliver Bldg., Pittsburgh, Pa
Canadian Representative:
The Holden Co., Ltd.,
Montreal, Can

Ask for details and rates on
Classified Advertising
in this publication

Nichols Transfer Tables
Turntable Tractors
Geo. P. Nichols & Bro. Chicago
2139 Fulton Street

UNION STEEL CASTING COMPANY PITTSBURGH, PA.
Cast Steel Locomotive Cylinders, Carbon and Vanadium Cast Steel Locomotive Frames. Wheel Centers, Crossheads and General Miscellaneous Castings for Locomotive and Car Work.

Staybolt Iron Lewis Special
Solid or Hollow Drilled Staybolts, Lewis Engine Bolt Iron. Also Ryerson Railroad Shop Machinery. Complete stocks of steel for immediate shipment. Write for complete information.
Chicago, Milwaukee, St. Louis, Cincinnati, Cleveland, Detroit, Buffalo, Boston, Philadelphia, Jersey City
Ryerson

OLD STYLE HAND PUDDLED
LOGAN IRON
STAYBOLT — ENGINEBOLT — FORGING IRON
CHAIN — LOGAN IRON & STEEL CO. — RIVET
BURNHAM, PA. PHILADELPHIA, PA.

Western
DUMP CARS
Are Quick Operating
WESTERN WHEELED SCRAPER CO.
Builders of Air Dump Cars
AURORA, ILLINOIS

TIE PLATES
Track Appliances
Highway Crossing Signals
Signal Accessories
THE RAILROAD SUPPLY COMPANY
CHICAGO NEW YORK

Union Spring & Manufacturing Co
Steel Castings, Coil Springs, Spring Plates,
Elliptic Springs, Journal Box Lids
Kensington (All Steel) Journal Box
WORKS: New Kensington, Pa.
PITTSBURGH OFFICE: 2001 Clark Building

THE "FAIR"
RAIL ANTI-CREEPER
THE P & M. CO.
CHICAGO NEW YORK
Montreal London Paris Calcutta Sydney

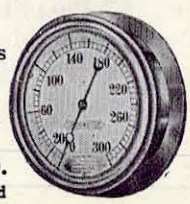
A QUALITY PRODUCT
RESULT OF 40 YEARS EXPERIENCE
TUCOLITH
FLEXOLITH
CAR FLOORING
TUCO PRODUCTS CORP.
30 CHURCH STREET, NEW YORK
122 S. MICHIGAN AVE., CHICAGO

New Journal Box Lid requirements per A.R.A. circular No. A-337-1930 are complied with in ASCO A. R. A. Special Torsion Spring Journal Box Lids.
Allegheny
ALLEGHENY STEEL COMPANY, General Offices and Works: BRACKENRIDGE, PA.
New York Buffalo Cleveland Chicago Detroit Milwaukee St. Louis Los Angeles
Sheets for Automobile Bodies · Metallic Furniture · Deep Draws · Allegheny Metal · Ascoloy · Electrical Sheets · Steel Castings · Better Tubes · Pipe

Hollow Iron Bars up to 14 ft. long—Solid to 16 ft. Hollow or solid Stays, plain, headed, or headed and threaded.

UNARCO
Asbestos and Rubber Packings for Railroad Use. Asbestos Insulating Materials
UNION ASBESTOS & RUBBER CO.
310 South Michigan Ave. Chicago, Ill.

Ashton High Grade
Pop Valves—Steam Gauges
the quality standard for over 50 years.
Exclusive features insuring greatest efficiency and durability.
THE ASHTON VALVE CO.
New York, Boston, Chicago and San Francisco



PROFESSIONAL DIRECTORY

BATTEY & KIPP
INCORPORATED
Engineers
Complete Railroad Shops and Locomotive Terminals
Power Plants
Industrial Properties
231 So. La Salle St., Chicago

Robert W. Hunt Company
ENGINEERS
Inspection—Tests—Consultation
All Railway Equipment, Structures and Materials
General Office:
22nd Floor Insurance Exchange CHICAGO
Offices in all principal cities

JOHN E. MUHLFELD
TRANSPORTATION ENGINEERING
25 Broad Street, New York

Place Your Card Here

Gulick-Henderson Company
ENGINEERS
Inspection and Tests
Materials and Equipment
for Railways
General Office:
19 West 44th Street, New York
Branches Main Mill Districts U. S.
Dusseldorf, Germany

Use This Space for Your Card

Pittsburgh Testing Laboratory
Pittsburgh, Penna.
Analysis . . Inspection . . Testing . . Research
Branch Offices in the Principal Cities

Second Hand Equipment — Get Together Department — Factory and Railroad Equipment

POSITION OPEN

IF you are open to overtures for new connection, and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty-one years. Send only name and address for details. R. W. Bixby, Inc., 102 Downtown Building, Buffalo, New York.

POSITION WANTED

MECHANICAL ENGINEER—College Degree—wide experience in railway equipment engineering, car design, estimates, special investigations. Licensed Professional Engineer. Desires new connection after September 1st. Best references. Address Box 840 RAILWAY AGE, 30 Church St., New York City.

POSITION WANTED

OPPORTUNITY DESIRED with Railway Supply Company or Machine Tool Builder. Technical graduate with 12 years of practical railroading in mechanical department of large system, plus broad experience in railway supply marketing methods, desires position as sales engineer or as assistant to busy executive. Capable of conducting tests or handling all details including preparation of catalogs and all other publicity. Address Box 839, Railway Age, 30 Church Street, New York City.

EDUCATIONAL

SEND for Free Special Bulletin and learn how to increase your knowledge of practical railroad work and fit yourself for promotion. The Railway Educational Bureau, Omaha, Neb.

Take advantage of space in these columns.

RAILS
New and Relaying — Frogs — Tie Plates — Angle Bars—Cars of all types including Tank Cars, Hart Cars, Flat Cars, Box Cars—Railway Equipment—Used Car Parts—Steel Sheet Piling, both new and used.
HYMAN-MICHAELS COMPANY
New York, Los Angeles, Seattle, St. Louis — 20 No. Wacker Drive Bldg. CHICAGO, Paris, France — Pittsburgh, Houston, Portland, San Francisco

FOR SALE
Five Standard Gauge Locomotives
only $12,500.00
W. D. Corley, Jr., Colorado Springs, Colo.

"A Single Breaker May Recede—but The Tide Is Coming In!"

Action is the price of progress. Effective action means sustained product improvement and consumer education. This in turn requires expert assistance.

When you are in need of industrial and technical executives, professional engineers, or technicians—communicate with—Engineering Societies Employment Service: New York Office—Walter V. Brown, Manager, 31 West 39th Street; Chicago Office—A. Krauser, Manager, 205 West Wacker Drive; San Francisco Office—Newton D. Cook, Manager, Room 715, 57 Post Street.

Should your requirements be for business or trade executives, write:—American Trade Association Executives, 45 East 17th Street, New York, N. Y.

This service is the contribution of these professional organizations to industry

For location of advertisements in this issue of manufacturers listed in the Buyers Index, see Advertisers Index on the last page next to cover

BUYERS INDEX

Accounting Machines.
Burroughs Adding Machine Co.
Remington-Rand Business Service.

Acetylene, Dissolved.
Oxweld Railroad Service Co., The.

Adding Machines & Typewriters.
Burroughs Adding Machine Co.

Attercoolers, Air.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Air Brakes.
New York Air Brake Co.
Westinghouse Air Brake Co.

Aircraft Corrugated Sheet.
Aluminum Co. of America.

Aircraft Extruded & Rolled Shapes.
Aluminum Co. of America.

Aircraft Plates.
Aluminum Co. of America.

Aircraft Screw Machine Products.
Aluminum Co. of America.

Aircraft Streamline & Round Tubing.
Aluminum Co. of America.

Air Lifts.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Airport Drainage.
Republic Steel Corp.

Air Pumps.
New York Air Brake Co.
Union Asbestos & Rubber Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Air Reservoir Joints—(See Joints, Air Reservoir).

Alloy Steel.
Bethlehem Steel Co.
Illinois Steel Co.
Republic Steel Corp.
Ryerson & Son, Inc., Jos. T.

Alloys, Strong Aluminum.
Aluminum Co. of America.

Angle Bars — (See Joints, Rail).

Angles, Channels and Tees—(See Shapes, Structural).

Anti-Creepers, Rail.
Bethlehem Steel Co.
P. & M. Company, The.

Arch, Locomotive Brick.
American Arch Co., Inc.

Arresters, Lightning.
General Electric Co.
General Railway Signal Co.
P. & M. Company.
Railroad Supply Co., The.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Ash Conveyors.
Industrial Brownhoist Corp.

Ash Handling Machinery.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Ash Pans, Cast Steel.
General Steel Castings Corp.

Auxiliary Locomotive.
Bethlehem Steel Co.

Axles, Car and Locomotive.
American Locomotive Co.
Baldwin Locomotive Works.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Lima Locomotive Works.
Midvale Co., The.
Standard Steel Works Co.

Axles, Mine Car.
Brill Co., The J. G.
Mt. Vernon Car Mfg. Co.

Axles, Motor Trucks.
Timken-Detroit Axle Co.

Babbitt Metal.
National Bearing Metals Corp.
Ryerson & Son, Inc., Jos. T.
Westinghouse Elec. & Mfg. Co.

Baggage Door Controller Device.
Edwards Co., O. M.

Barges, Steel.
American Bridge Co.

Barges, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Bars, Concrete, Reinforcing.
Carnegie Steel Co.
Central Alloy Steel Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Bars, Iron and Steel.
Armco Railroad Sales Co.
Carnegie Steel Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Illinois Steel Co.
Inland Steel Company.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
McConway & Torley Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Bars, Rolled Steel.
Carnegie Steel Co.

Batteries, Lighting.
Electric Storage Battery Co.

Batteries, Starting.
Electric Storage Battery Co.

Batteries, Storage.
Electric Storage Battery Co.
Railroad Supply Co.
Safety Car Heating & Lighting Co.

Batteries, Wet Cell.
Electric Storage Battery Co.

Beams, Channel & Angle.
Carnegie Steel Co.
Illinois Steel Co.
Ryerson & Son, Inc., Joseph T.

Bearings, Axle Generator.
S. K. F. Industries, Inc.
Westinghouse Elec. & Mfg. Co.

Bearings, Ball Thrust.
S. K. F. Industries, Inc.
Timken Roller Bearing Co., The.

Bearings, Center.
Brill Co., The J. G.
Chicago Railway Equipment Co.
Miner, W. H.
Pressed Steel Car Co.
Symington Co., The.

Bearings, Journal.
Fafnir Bearing Co.
Magnus Co., Inc.
National Bearing Metals Corp.
S. K. F. Industries, Inc.
Timken Roller Bearing Co., The.

Bearings, Journal Roller.
Fafnir Bearing Co.
S. K. F. Industries, Inc.
Timken Roller Bearing Co., The.

Bearings, Roller.
American Steel Foundries Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Miner, W. H.
Shafer Bearing Corp.
S. K. F. Industries, Inc.
Standard Car Truck Co.
Stucki Co., A.
Timken Roller Bearing Co.
Wine Railway Appliance Co.

Bearings, Roller Side.
Q. & C. Company, The.
Standard Coupler Co.
Stucki Co., A.

Bearings, Side.
American Steel Foundries.
Chicago Railway Equipment Co.
Fort Pitt Malleable Iron Co.
Standard Car Truck Co.
Stucki Co., A.
Wine Railway Appliance Co.

Beds, Cast Steel, Locomotive.
General Steel Castings Corp.

Bell Ringer, Locomotive.
Ardco Mfg. Co.
Prime Mfg. Co., The.

Bells, Highway Crossing.
Railroad Supply Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Mach. Co.

Benders, Rail.
Q & C Co., The

Bending and Straightening Machines.
Ryerson & Son, Jos. T.
Sellers & Co. Inc., Wm.

Billing Machines
Burroughs Adding Machine Co.

Billets, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
McConway & Torley Co.
Midvale Co., The.
Ryerson & Son, Jos. T.
Republic Steel Corp.
Standard Steel Works Co.

Blocks, Chain.
Barco Mfg. Co.

Blocks, Creosoted.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
International Creosoting & Constr. Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Blooms, Steel.
Carnegie Steel Co.
Republic Steel Corp.

Blower Fittings, Automatic Smokebox.
Barco Mfg. Co.

Blowers, Turbo.
Ingersoll-Rand Co.

Blowtorches, Acetylene.
Oxweld Railroad Service Co., The.

Boiler (all types).
Baldwin Locomotive Works, The.

Boiler Checks.
Prime Manufacturing Co., The.

Boilers, Locomotive.
American Locomotive Co.
Baldwin Locomotive Works
Lima Locomotive Works.

Boilers, Scale Proof.
Industrial Brownhoist Corp.

Bolsters, Steel.
American Steel Foundries.
Bettendorf Co., The.
Birdsboro Steel Foundry & Mach. Co.
Bradford Corporation.
Brill Co., The J. G.
Buckeye Steel Castings Co.
Gould Coupler Co., The.
Mt. Vernon Car Mfg. Co.
Ohio Steel Foundry Co., The
Pressed Steel Car Co.
Symington & Son, Inc., T. H.

Bolts and Nuts.
Baldwin Locomotive Works, The
Bethlehem Steel Co.
Buffalo Brake Beam Co.
Dardelet Threadlock Corp.
Neely Nut & Bolt Co.
Russell, Burdsall & Ward Bolt and Nut Co.
Ryerson & Son, Joseph T.
Westinghouse Elec. & Mfg. Co.

Bolts & Nuts, Monel Metal.
International Nickel Co., The.

Bolts, Patch.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Bolts, Track.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Bonders, Rail.
Q & C Co., The.

Bonding Rail Outfits.
Ingersoll-Rand Co.

Bonds, Rail.
American Steel & Wire Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Bonds, Signal.
American Steel & Wire Co.
Railroad Supply Co.

Bond, Wire Protection.
P & M Co., The.

Bookkeeping Machines.
Burroughs Adding Machine Co.

Boosters, Locomotives.
Franklin Railway Supply Co., Inc.

Boring & Drilling Machines, Horizontal.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.

Boring Machines, Car Wheel
Sellers & Co., Inc., Wm.

Boring & Turning Mills. Horizontal.
Sellers & Co., Inc., Wm.

Boring & Turning Mills. Vertical.
Sellers & Co., Inc., Wm.

Braces, Rail
Bettendorf Co., The.
Fort Pitt Malleable Iron Co.
National Malleable & Steel Castings Co.
Q & C Co., The.
Ramapo Ajax Co.
Symington Co., The.

Brake Beam Safety Guards.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.

Brake Beam Supports.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.

Brake Beams.
American Steel Foundries.
Bradford Corporation.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
Hunt-Spiller Mfg. Corp.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car. Co.

Brake Drums.
American Car & Foundry Motors Co.
Hunt-Spiller Mfg. Corp.

Brake Forgings, Pins, Levers, etc.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Davis Brake Beam Co.
Mt. Vernon Car Mfg. Co.
Schaefer Equipment Co.

Brakes, Hand.
National Brake Co.

Brake Heads.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
Pressed Steel Car Co.

Brake Jaws.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Schaefer Equipment Co.

Brake Shoes.
American Brake Shoe & Foundry Co.
American Steel Foundries.
Brill Co., The J. G.
Buckeye Steel Castings Co.
Fort Pitt Malleable Iron Co.
Mt. Vernon Car Mfg. Co.

Brakes, Air.
General Electric Co.
New York Air Brake Co.
Westinghouse Air Brake Co.

Brakes, Clasp.
American Steel Foundries.

Brakes, Electric.
New York Air Brake Co.
Westinghouse Air Brake Co.

Brakes, Hand.
Miner, W. H.
National Brake Co.
National Malleable & Steel Castings Co.
Wine Railway Appliance Co.

Brass, Sash.
Edwards Co., O. M.

Brick, Locomotive Arch.
American Arch Co., Inc.

Bridge Builders.
American Bridge Co.
Bethlehem Steel Co.

Bridge & Crossing Planks, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Bridge Flooring.
Carey Co., The, Philip.

Bridge Material, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Bridge Stringers — (See Stringers, Bridge).

Bronze Powder, Aluminum.
Aluminum Co. of America.

Bucket Handling.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Buckets, Grab.
American Bridge Co.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Buffers, Friction.
Edgewater Steel Co.
Miner, W. H.
Standard Coupler Co.
Westinghouse Air Brake Co.

Buffers, Radial.
Franklin Railway Supply Co., Inc.

Building Materials.
Carey & Co., Philip, The.
Johns-Manville Corp.

Buildings, Iron, Steel and Steel Concrete.
American Bridge Co.
United Engineers & Constructors, Inc.

Bulldozers.
Ryerson & Son, Joseph T.

Buses, Motor.
Reo Motor Car Co.

Cable Accessories, Electrical.
Graybar Electric Co.

Cables, Electric.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Co.
Graybar Electric Co.
Kerite Insulated Wire & Cable Co.
Okonite Co., The.

Cableways—(See Tramways).

Calculating Machines.
Burroughs Adding Machine Co.

Caps, Grease.
Prime Mfg. Co., The.

Carbide, Calcium.
Oxweld Railroad Co., The.
Union Carbide Sales Co.

Car Insulation.
Carey & Co., Philip, The.
Wood Conversion Co.

Car Lighting Equipment—(See Lighting, Car Equipment).

Carlines.
Hutchins Car Rfg. Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Car Material, Wood.
Central Coal & Coke Co.

Car Parts and Appliances.
Pressed Steel Car Co.
Pullman Car & Mfg. Corp.

Car Parts, Freight.
Bettendorf Co., The.
General American Tank Car Corporation.
Pressed Steel Car Co.

Car Parts, Passenger.
Brill Co., The J. G.
St. Louis Car Co.

Car Repairs.
General American Tank Car Corporation.
Pressed Steel Car Co.
St. Louis Car Co.
Tennessee Coal, Iron & Railroad Co.

Car Retarder Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Car Siding — (See Siding, Car, etc.).

Cars, Baggage.
Brill Co., The J. G.
Pressed Steel Car Co.
St. Louis Car Co.

Cars, Ballast.
Bethlehem Steel Co.
General American Tank Car Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Caboose, Coal & Stock.
Mt. Vernon Car Mfg. Co.

Cars, Convertible.
Mt. Vernon Car Mfg. Co.

Cars, Dump.
Bethlehem Steel Co.
Bettendorf Co., The.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Flat, Narrow Gauge.
Bettendorf Co., The.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Freight.
Bethlehem Steel Co.
Bettendorf Co., The.
General American Tank Car Corp.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Pullman Car & Mfg. Co.

Cars, Freight (New and Repaired).
Bethlehem Steel Co.
Bettendorf Co., The.
General American Tank Car Corp.
Pressed Steel Car Co.

Cars, Gasoline-Electric.
Brill Co., The J. G.
Electro-Motive Co.
St. Louis Car Co.

Cars, Gasoline Motor.
Brill Co., The J. G.

Cars, Hand & Push.
Fairbanks-Morse & Co.

Cars, Industrial.
Bethlehem Steel Co.
Brill Co., The J. G.
General American Tank Car Corp.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Motor.
Fairbanks-Morse & Co.

Cars, Motor Inspection.
Fairbanks-Morse & Co.

Cars, Oil Electric.
Westinghouse Elec. & Mfg. Co.

Cars, Ore.
Brill Co., The J. G.
General American Tank Car Corp.
Pressed Steel Car Co.

Cars, Passenger.
Bethlehem Steel Co.
Brill Co., The J. G.
Electro-Motive Co.
Pressed Steel Car Co.
Pullman Car & Mfg. Corp.

Cars, Power Units.
Brill Co., The J. G.
Electro-Motive Co.

Cars, Quarry.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Rebuilt and Repaired.
Bettendorf Co., The.
General American Tank Car Corp.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Refrigerator.
General American Tank Car Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Cars, Second-Hand.
Pressed Steel Car Co.
Western Wheeled Scraper Co.

Cars, Self-Propelled Passenger.
Brill Co., The J. G.
Electro-Motive Co.
General Electric Co.
Pullman Car & Mfg. Corp.
Westinghouse Elec. & Mfg. Co.

Cars, Spreader.
Western Wheeled Scraper Co.

Cars, Tank.
Bethlehem Steel Co.
General American Tank Car Corp.
Indian Refining Co.
Pressed Steel Car Co.

Cars, Dump.
Western Wheeled Scraper Co.

Castings, Alloy Steel.
Symington Co., The.
Union Spring & Mfg. Co.

Castings, Brass and Bronze.
Baldwin Locomotive Works, The.
General Railway Signal Co.
Magnus Co., Inc.
National Bearing Metals Corp.
Union Switch & Signal Co.

Castings, Gray Iron.
American Brake Shoe & Foundry Co.
American Locomotive Co.
Baldwin Locomotive Works.
General Railway Signal Co.
Mt. Vernon Car Mfg. Co.
Ramapo Ajax Corp.
Union Switch & Signal Co.

Castings, Gun Iron.
Hunt-Spiller Mfg. Corp.

Castings, Iron & Steel.
Baldwin Locomotive Works, The.
Industrial Brownhoist Corp.

Castings, Malleable Iron.
Buckeye Steel Castings Co.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
Fort Pitt Malleable Iron Co.
National Malleable & Steel Castings Co.
P & M Company, The.
Pressed Steel Car Co.
Symington Co., The.
Universal Draft Gear Attachment Co.

Castings, Monel Metal.
International Nickel Co., The.

Castings, Steel.
Allegheny Steel Co.
American Locomotive Co.
American Steel Foundries.
Bethlehem Steel Co.
Bettendorf Co., The.
Birdsboro Steel Foundry & Mach. Co.
Buckeye Steel Castings Co.
General Steel Castings Corp.
Gould Coupler Co., The.
McConway & Torley Co.
Midvale Co., The.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Steel Casting Co.
Universal Draft Gear Attachment Co.

Castings, Steel Loco.
Birdsboro Steel Foundry & Machine Co.
General Steel Castings Corp.
Gould Coupler Co. The.
Ohio Steel Foundry Co., The.
Standard Steel Works Co.
Union Steel Casting Co.

Castings, Steel Vanadium.
Birdsboro Steel Foundry & Machine Co.
Brill Co., The J. G.
Ohio Steel Foundry Co., The.
Standard Steel Works Co.
Union Steel Casting Co.

Catchbasins, Iron.
Armco Culvert Mfrs. Assoc.

Cellers, Engine Truck.
Ardco Mfg. Co.

Cement Car, Asphalt.
Lehon Co., The.
Sherwin-Williams Co.

Cement, High Temperature.
Carey Co., Philip, The.
Johns-Manville Corp.

Cements, Asbestos and Magnesia.
Carey Co., Philip, The.

Center Plates—(See Bearings, Center).

Center Sills.
Bettendorf Co., The.
Bradford Corporation.

Chain Iron.

Chain, Monel Metal.
International Nickel Co., The.

Chemicals.
Bird-Archer Co., The.
Dearborn Chemical Co.
Hunt Co., Robert W.

Chemicals, Boiler.
Bird-Archer Co., The.
Dearborn Chemical Co.

Chemicals, Cleaning.
Oakite Products, Inc.

Chemists.
Bird-Archer Co., The.
Dearborn Chemical Co
Hunt Co., Robert W.
Pittsburgh Testing Laboratory.

Chromium Plating.
Worthington Pump & Machinery Corp.

Chucks, Lathe.
Ryerson & Son, Jos. T.

Cinder Handling Plants.
Roberts & Schaefer Co.

Circuit Breakers.
General Electric Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Clamps, Forging.
Ryerson & Son, Jos. T.

Clamps, Guard Rail.
O. & C. Co., The.
Westinghouse Air Brake Co.

Clamps, Hose.
Ingersoll-Rand Co.
National Malleable & Steel Castings Co.
Vapor Car Heating & Lighting Co.
Westinghouse Air Brake Co.

Clamps, Pipe.
Franklin Railway Supply Co., Inc.
National Malleable & Steel Castings Co.

Clamps, Rail Cutting.
Oxweld Railroad Service Co., The.

Classification Yard Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Cleaners, Aircraft.
Oakite Products, Inc.

Cleaners, Air Pump.
Oakite Products, Inc.
Westinghouse Air Brake Co.

Cleaners, Bus & Truck.
Oakite Products, Inc.

Cleaners, Car.
Oakite Products, Inc.

Cleaners, Flue.
Ryerson & Son, Jos. T.

Cleaners, General.
Oakite Products, Inc.

Cleaners, Locomotive.
Oakite Products, Inc.

Cleaners, Metal.
Oakite Products, Inc.

Clips, Wire Rope.
American Steel & Wire Co.

Coach and Coach Yard Steam Joints—(See Joints, etc.)

Coaches, Motor.
American Car & Foundry Motors Co.
Dodge Motor Truck Corp.
International Harvester Co.
White Co., The.

Coaches, SecondHand.
Hyman-Michaels Co.

Coal, Ore & Ash Handling Machinery.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.
Roberts & Schaefer Co.

Coal Pushers.
Standard Stoker Co.

Coaling Stations.
American Bridge Co.
FairbanksMorse & Co.
Roberts & Schaefer Co.

Cocks, Angle.
Westinghouse Air Brake Co.

Cocks, Blow-Off.
Bird-Archer Co., The.

Cocks, Cylinder.
Prime Manufacturing Co., The.

Columns, Water.
Prime Manufacturing Co., The.

Combination Crane Pile Drivers.
Industrial Brownhoist Corp.

Compounds, Boiler.
Dearborn Chemical Co.
Bird-Archer Co., The.

Compounds, Cleaning.
Oakite Products, Inc.

Compounds, Cutting.
Oakite Products, Inc.

Compounds, Grinding.
Oakite Products, Inc.

Compounds, Paint Removing.
Oakite Products, Inc.

Compounds, Rust Proofing.
Oakite Products, Inc.

Compressors, Air.
Ingersoll-Rand Co.
New York Air Brake Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Concrete Floor Slabs.
Federal American Cement Tile Co.

Concrete Reinforcement.
American Steel & Wire Co.
Carnegie Steel Co.
Ryerson & Son, Jos. T.

Concrete Roofing, Tile.
Federal American Cement Tile Co.

Condensers.
Ingersoll-Rand Co.

Condensing Apparatus.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Conduit, Rigid.
Aluminum Co. of America.

Conduits, Metallic Flexible.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Graybar Electric Co.
Vapor Car Heating Co., Inc.

Conduit, Underground.
Graybar Electric Co.
Johns-Manville Corp.

Connections, Lever.
National Malleable & Steel Castings Co.

Connections, Truck.
National Malleable & Steel Castings Co.

Connections, Truck Lever.
Schaefer Equipment Co.

Contraction Joint.
General Railway Signal Co.

Control Devices, Train Speed.
Union Switch & Signal Co.

Control, Locomotive.
Valve Pilot Co.

Controllers, Electric.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Conveying Machinery.
American Bridge Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Corrugated Sheet.
Aluminum Co. of America.

Conveyor, Ash—(See Coal, Ore and Ash Handling Mach.).

Coupler Pockets—(See Draft Yokes).

Coupler Yokes.
Bettendorf Co., The.
Gould Coupler Co.
Symington Co., The.

Couplers.
American Steel Foundries.
Buckeye Steel Castings Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
McConway & Torley Co.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Westinghouse Air Brake Co.

Couplings, Hose.
Fort Pitt Malleable Iron Co.
Gold Car Heating & Lighting Co.
Ingersoll-Rand Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Cranes, Ballast Cleaning.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Barge.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Bracket.
Shephard-Niles Crane & Hoist Corp.

Cranes, Crawler.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Crawling Shovels and Draglines.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Diesel.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Electric Traveling.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Gantry.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.
Shephard-Niles Crane & Hoist Corp.

Cranes, Gasoline.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Grab Bucket.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Handpower.
Industrial Brownhoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Jib.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Worthington Pump & Machinery Corp.

Cranes, Locomotive.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.

Cranes, Overhead.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Pillar.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Portable.
Orton Crane & Shovel Co.

Cranes, Transfer.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Traveling.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Wharf.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Wrecking.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Crank Pins — (See Pins, Crank).

Creosote.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
International Creosoting & Constr. Co.
National Lumber & Creosoting Co.

Creosote, Wood Preservative Treatment.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Cribbing Units.
Federal American Cement Tile Co.

Cross Arms, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Steel.
Bethlehem Steel Co.

Crossheads & Shoes.
Baldwin Locomotive Wks.
Barco Mfg. Co.
International Creosoting & Construction Co.

Crossing Signals & Signs.
Railroad Supply Co.

Crossings—(See Frogs and Crossings).

Crossings, Pavement.
Carey Co., The Philip.

Crushers, Coal.
American Sheet & Tin Plate Co.
Orton Crane & Shovel Co.

Culverts.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Toncan Culvert Manufacturers' Association.

Culverts, Corrugated Iron
Armco Culvert Manufacturers' Association.
Republic Steel Corp.

Culverts, Part Circle
Armco Culvert Manufacturers Association

Culverts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cups, Oil.
New York Air Brake Co.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.

Curtains & Fixtures, Car Window.
Pantasote Co., Inc., The.

Curtain Material, Car.
Ryerson & Son, Jos. T.

Curtains, Cab.
Lehon Co., The.

Cutting and Welding Apparatus.
Oxweld Railroad Service Co.
Westinghouse Electric & Mfg. Co.

Cut-Off Indicators and Recorders.

Cylinder Parts, Finished and Rough.
Locomotive Finished Material Co.
National Tube Co.
Valve Pilot Co.

Cylinders, Air Brake.
Westinghouse Air Brake Co.

Cylinders, Cast Steel Locomotive.
General Steel Castings Corp.
Union Steel Casting Co.

Cylinders, Locomotive.
Locomotive Finished Material Co.

Cylinders, Oxy-Acetylene.
Oxweld Railroad Co., The.

Deoxidizers.
Q & C Co., The.
Vanadium Corp. of America.

Derricks.
Industrial Brownhoist Corp.

Diesel Electric Power Plants.
Fairbanks-Morse & Co.
Westinghouse Elec. & Mfg. Co.

Dirt Collectors.
New York Air Brake Co.
Westinghouse Air Brake Co.

Disinfectants.
West Disinfecting Co.

Dispatching Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Ditching Machinery.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Door Fixtures — (See Fixtures, Car Door).

Doors, Car.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
Wine Railway Appliance Co.

Doors, Locomotive Firebox.
Franklin Railway Supply Co., Inc.

Doors, Rolling, Steel.
Kinnear Mfg. Co.

Draft Arms.
American Steel Foundries.
Birdsboro Steel Foundry & Machine Co.
Bradford Corporation.
Symington Co., The.
Universal Draft Gear Attachment Co.

Draft Gear Attachments.
Symington Co., The

Draft Gears.
American Steel Foundries.
Bradford Corporation.
Cardwell-Westinghouse Co.
Edgewater Steel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Union Draft Gear Co.
Universal Draft Gear Attachment Co.

Draft Yokes.
American Steel Foundries.
Bettendorf Co., The.
Buckeye Steel Castings Co.
Gould Coupler Co., The.
McConway & Torley Co.
Miner, W. H.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Co.
Symington Co., The.
Universal Draft Gear Attachment Co.

Drainage Gates, Automatic
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

Drains, Perforated Iron.
Republic Steel Corp.

Drawbar Centering Device.
Gould Coupler Co., The.
Miner, W. H.

Drawbars, Unit Safety.
Franklin Railway Supply Co., Inc.
Industrial Brownhoist Corp.

Dredging Machinery.
Industrial Brownhoist Corp.

Drilling Machines.
Sellers & Co., Inc., Wm.

Drilling Machines, Bonding.
Railroad Supply Co.

Drilling Machines, Pneumatic
Ingersoll-Rand Co.

Drilling Machines, Rock.
General Electric Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drilling Machines, Upright and Radial.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.

Drills.
Ingersoll-Rand Co.

Drills, Close Corner.
Ingersoll-Rand Co.

Drills, Concrete.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Steel Rock and Steel Sharpened.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Track & Bending.
Bird-Archer Co., The.
Ingersoll-Rand Co.

Drive Gas Electric Coaches.
General Electric Co.

Drive Gas Electric Locomotives
Westinghouse Electric & Mfg. Co.

Driving Boxes (Extended Main).
Franklin Railway Supply Co., Inc.

Drop Door Mechanism.
Wine Railway Appliance Co.

Dynamos—(See Generators, Electric).

Electrical Cable Accessories.
General Electric Supply Corp.

Electric Cables.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Electrical Instruments.
Electric Service Supplies Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Electrical Supplies.
General Electric Co.
General Electric Supply Corp.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Electrification, Railroad.
Battey & Kipp.
General Electric Co.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.

Electric Heaters.
General Electric Supply Corp.

Electrical Insulation.
General Cable Corp.
General Electric Supply Corp.

Electrical Porcelain Insulators.
General Electric Supply Corp.

Electric Motors.
General Electric Supply Corp.

Electric Rivet Heaters.
General Electric Supply Corp.

Electric Switches.
General Electric Supply Corp.

Enamels.
Lowe Bros. Co., The.
Sherwin-Williams Co.

End Frames, Cast Steel, Passenger Car.
General Steel Castings Corp.

Ends, Steel.
Hutchins Car Rfg. Co.
Union Metal Products Co.

Engineers, Consulting, Civil, Elec., Hydraulic. Mechanical.
Battey & Kipp.
Hunt Co., Robt. W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Contracting.
Battey & Kipp.
United Engineers & Constructors, Inc.

Engineers and Contractors.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Construction.
Battey & Kipp.
Roberts & Schaefer Co.
United Engineers & Constructors, Inc.

Engineers and Contractors, Elec., Hydraulic, Mech.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
Roberts & Schaefer Co.

Engineers, Inspecting.
Gulick-Henderson Co.
Hunt Co., Robert W.
Muhlfeld, John E.
Pittsburgh Testing Laboratory.
United Engineers & Constructors, Inc.

Engineers, Valuation.
Hunt Co., Robert W.
United Engineers & Constructors, Inc.

Engines, Crude & Fuel Oil.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Diesel.
Worthington Pump & Machinery Corp.

Engines, Gas.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Engines, Gas & Gasoline.
American Car & Foundry Motors Co.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Hoisting.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Excavators.
Industrial Brownhoist Corp.

Exhaust & Heater Pipe.
Union Asbestos & Rubber Co.

Exhaust & Ventilating Fans.
General Electric Supply Corp.

Expanders, Tube.
Ryerson & Son, Joseph T.

Fans, Exhaust & Ventilating.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Fasteners, Car Door.
Camel Sales Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Feed Water Heater Systems.
Bird-Archer Co., The.
Coffin, Jr., Co., The J. S.
Worthington Pump & Machinery Corp.

Fencing Wire—(See Wire, Fence).

Fence Posts, Treated.
American Steel & Wire Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Ferro Alloys.
Vanadium Corp. of America.

Ferro, Chromium.
Vanadium Corp. of America.

Ferro, Molybdenum.
Electro Metallurgical Sales Corp.
Vanadium Corp. of America.

Ferro, Silicon.
Vanadium Corp. of America.

Ferro, Tungsten.
Vanadium Corp. of America.

Ferro, Vanadium.
Vanadium Corp. of America.

Filters, Air.
New York Air Brake Co.
Westinghouse Air Brake Co.

Filters, Water & Industrial.
Graver Tank & Mfg. Corp.

Filtration Plants (Water).
Graver Tank & Mfg. Corp.

Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works.

Fire Fighting & Protection Equipment.
Johns-Manville Corp.

Fittings, Air Brakes.
Westinghouse Air Brake Co.

Fittings, Steam.
Vapor Car Heating Co., Inc.

Fixtures, Car Door.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Flangers, Snow.
Q & C Co., The.

Floodlights.
General Electric Supply Corp.
Graybar Electric Co.
Oxweld Railroad Service Co.
Pyle-National Co.
Symington Co., The.
Westinghouse Elec. & Mfg. Co.

Floodlights, Acetylene.
Oxweld Railroad Service Co., The.

Flooring.
Carey & Co., Philip, The.
Johns-Manville Corp.

Flooring, Car.
Tuco Products Corp.

Flooring, Coach.
Tuco Products Corp.

Flooring, Composition.
Johns-Manville Corp.
Tuco Products Corp.

Flooring, Treated.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Floor Plates, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Company

Floor Slabs, Concrete.
American Cement Tile Mfg. Co.

Flue Cleaners—(See Cleaners, Flue).

Flue Cutters—(See Cutters, Flue).

Flues, Boiler—(See Tubes, Boiler).

Flue Shop Equipment.
Ryerson & Son, Joseph T.

Forges, Rivet Heating.
Ryerson & Son, Joseph T.

Forging Hammers.
Industrial Brownhoist Corp.

Forgings.
American Bridge Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Bethlehem Steel Co.

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Logan Iron & Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co.

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts' & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co.

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Baldwin Locomotive Works, The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety).

Stokers, Locomotive.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Okonite Co., The.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

Testers, Rail.
Sperry Products, Inc.

Testers, Staybolt.
Flannery Bolt Co.

Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.

Cranes, Transfer.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Traveling.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Wharf.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Wrecking.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Crank Pins — (See Pins, Crank).

Creosote.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
International Creosoting & Constr. Co.
National Lumber & Creosoting Co.

Creosote, Wood Preservative Treatment.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Cribbing Units.
Federal American Cement Tile Co.

Cross Arms, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Steel.
Bethlehem Steel Co.

Crossheads & Shoes.
Baldwin Locomotive Wks.
Barco Mfg. Co.
International Creosoting & Construction Co.

Crossing Signals & Signs.
Railroad Supply Co.

Crossings—(See Frogs and Crossings).

Crossings, Pavement.
Carey Co., The Philip.

Crushers, Coal.
American Sheet & Tin Plate Co.
Orton Crane & Shovel Co.

Culverts.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Toncan Culvert Manufacturers' Association.

Culverts, Corrugated Iron
Armco Culvert Manufacturers' Association.
Republic Steel Corp.

Culverts, Part Circle
Armco Culvert Manufacturers Association

Culverts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cups, Oil.
New York Air Brake Co.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.

Curtains & Fixtures, Car Window.
Pantasote Co., Inc., The.

Curtain Material, Car.
Ryerson & Son, Jos. T.

Curtains, Cab.
Lehon Co., The.

Cutting and Welding Apparatus.
Oxweld Railroad Service Co.
Westinghouse Electric & Mfg. Co.

Cut-Off Indicators and Recorders.

Cylinder Parts, Finished and Rough.
Locomotive Finished Material Co.
National Tube Co.
Valve Pilot Co.

Cylinders, Air Brake.
Westinghouse Air Brake Co.

Cylinders, Cast Steel Locomotive.
General Steel Castings Corp.
Union Steel Casting Co.

Cylinders, Locomotive.
Locomotive Finished Material Co.

Cylinders, Oxy-Acetylene.
Oxweld Railroad Co., The.

Deoxidizers.
Q & C Co., The.
Vanadium Corp. of America.

Derricks.
Industrial Brownhoist Corp.

Diesel Electric Power Plants.
Fairbanks-Morse & Co.
Westinghouse Elec. & Mfg. Co.

Dirt Collectors.
New York Air Brake Co.
Westinghouse Air Brake Co.

Disinfectants.
West Disinfecting Co.

Dispatching Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Ditching Machinery.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Door Fixtures — (See Fixtures, Car Door).

Doors, Car.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
Wine Railway Appliance Co.

Doors, Locomotive Firebox.
Franklin Railway Supply Co., Inc.

Doors, Rolling, Steel.
Kinnear Mfg. Co.

Draft Arms.
American Steel Foundries.
Birdsboro Steel Foundry & Machine Co.
Bradford Corporation.
Symington Co., The.
Universal Draft Gear Attachment Co.

Draft Gear Attachments.
Symington Co., The

Draft Gears.
American Steel Foundries.
Bradford Corporation.
Cardwell-Westinghouse Co.
Edgewater Steel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Union Draft Gear Co.
Universal Draft Gear Attachment Co.

Draft Yokes.
American Steel Foundries.
Bettendorf Co., The.
Buckeye Steel Castings Co.
Gould Coupler Co., The.
McConway & Torley Co.
Miner, W. H.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Co.
Symington Co., The.
Universal Draft Gear Attachment Co.

Drainage Gates, Automatic
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

Drains, Perforated Iron.
Republic Steel Corp.

Drawbar Centering Device.
Gould Coupler Co., The.
Miner, W. H.

Drawbars, Unit Safety.
Franklin Railway Supply Co., Inc.
Industrial Brownhoist Corp.

Dredging Machinery.
Industrial Brownhoist Corp.

Drilling Machines.
Sellers & Co., Inc., Wm.

Drilling Machines, Bonding.
Railroad Supply Co.

Drilling Machines, Pneumatic
Ingersoll-Rand Co.

Drilling Machines, Rock.
General Electric Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drilling Machines, Upright and Radial.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.

Drills.
Ingersoll-Rand Co.

Drills, Close Corner.
Ingersoll-Rand Co.

Drills, Concrete.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Steel Rock and Steel Sharpened.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Track & Bending.
Bird-Archer Co., The.
Ingersoll-Rand Co.

Drive Gas Electric Coaches.
General Electric Co.

Drive Gas Electric Locomotives
Westinghouse Electric & Mfg. Co.

Driving Boxes (Extended Main).
Franklin Railway Supply Co., Inc.

Drop Door Mechanism.
Wine Railway Appliance Co.

Dynamos—(See Generators, Electric).

Electrical Cable Accessories.
General Electric Supply Corp.

Electric Cables.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Electrical Instruments.
Electric Service Supplies Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Electrical Supplies.
General Electric Co.
General Electric Supply Corp.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Electrification, Railroad.
Battey & Kipp.
General Electric Co.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.

Electric Heaters.
General Electric Supply Corp.

Electrical Insulation.
General Cable Corp.
General Electric Supply Corp.

Electrical Porcelain Insulators.
General Electric Supply Corp.

Electric Motors.
General Electric Supply Corp.

Electric Rivet Heaters.
General Electric Supply Corp.

Electric Switches.
General Electric Supply Corp.

Enamels.
Lowe Bros. Co., The.
Sherwin-Williams Co.

End Frames, Cast Steel, Passenger Car.
General Steel Castings Corp.

Ends, Steel.
Hutchins Car Rfg. Co.
Union Metal Products Co.

Engineers, Consulting, Civil, Elec., Hydraulic. Mechanical.
Battey & Kipp.
Hunt Co., Robt. W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Contracting.
Battey & Kipp.
United Engineers & Constructors, Inc.

Engineers and Contractors.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Construction.
Battey & Kipp.
Roberts & Schaefer Co.
United Engineers & Constructors, Inc.

Engineers and Contractors, Elec., Hydraulic, Mech.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
Roberts & Schaefer Co.

Engineers, Inspecting.
Gulick-Henderson Co.
Hunt Co., Robert W.
Muhlfeld, John E.
Pittsburgh Testing Laboratory.
United Engineers & Constructors, Inc.

Engineers, Valuation.
Hunt Co., Robert W.
United Engineers & Constructors, Inc.

Engines, Crude & Fuel Oil.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Diesel.
Worthington Pump & Machinery Corp.

Engines, Gas.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Engines, Gas & Gasoline.
American Car & Foundry Motors Co.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Hoisting.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Excavators.
Industrial Brownhoist Corp.

Exhaust & Heater Pipe.
Union Asbestos & Rubber Co.

Exhaust & Ventilating Fans.
General Electric Supply Corp.

Expanders, Tube.
Ryerson & Son, Joseph T.

Fans, Exhaust & Ventilating.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Fasteners, Car Door.
Camel Sales Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Feed Water Heater Systems.
Bird-Archer Co., The.
Coffin, Jr., Co., The J. S.
Worthington Pump & Machinery Corp.

Fencing Wire—(See Wire, Fence).

Fence Posts, Treated.
American Steel & Wire Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Ferro Alloys.
Vanadium Corp. of America.

Ferro, Chromium.
Vanadium Corp. of America.

Ferro, Molybdenum.
Electro Metallurgical Sales Corp.
Vanadium Corp. of America.

Ferro, Silicon.
Vanadium Corp. of America.

Ferro, Tungsten.
Vanadium Corp. of America.

Ferro, Vanadium.
Vanadium Corp. of America.

Filters, Air.
New York Air Brake Co.
Westinghouse Air Brake Co.

Filters, Water & Industrial.
Graver Tank & Mfg. Corp.

Filtration Plants (Water).
Graver Tank & Mfg. Corp.

Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works.

Fire Fighting & Protection Equipment.
Johns-Manville Corp.

Fittings, Air Brakes.
Westinghouse Air Brake Co.

Fittings, Steam.
Vapor Car Heating Co., Inc.

Fixtures, Car Door.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Flangers, Snow.
Q & C Co., The.

Floodlights.
General Electric Supply Corp.
Graybar Electric Co.
Oxweld Railroad Service Co.
Pyle-National Co.
Symington Co., The.
Westinghouse Elec. & Mfg. Co.

Floodlights, Acetylene.
Oxweld Railroad Service Co., The.

Flooring.
Carey & Co., Philip, The.
Johns-Manville Corp.

Flooring, Car.
Tuco Products Corp.

Flooring, Coach.
Tuco Products Corp.

Flooring, Composition.
Johns-Manville Corp.
Tuco Products Corp.

Flooring, Treated.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Floor Plates, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Company

Floor Slabs, Concrete.
American Cement Tile Mfg. Co.

Flue Cleaners—(See Cleaners, Flue).

Flue Cutters—(See Cutters, Flue).

Flues, Boiler—(See Tubes, Boiler).

Flue Shop Equipment.
Ryerson & Son, Joseph T.

Forges, Rivet Heating.
Ryerson & Son, Joseph T.

Forging Hammers.
Industrial Brownhoist Corp.

Forgings.
American Bridge Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Bethlehem Steel Co.

Brill Co., The J. G.
Carnegie Steel Co.
Edgewater Steel Co.
General Railway Signal Co.
Gould Coupler Co., The.
Illinois Steel Co.
Midvale Co., The.
Mt. Vernon Car Mfg. Co.
Neely Nut & Bolt Co.
Pressed Steel Car Co.
Standard Steel Works Co.
Steel Car Forge Co.
Universal Draft Gear Attachment Co.

Forgings, Drop.
Baldwin Locomotive Works, The.
Brill Co., The J. G.
General Railway Signal Co.
Steel Car Forge Co.
Union Switch & Signal Co.

Forgings, Monel Metal.
International Nickel Co., The.

Foundry Supplies.
Bird-Archer Co., The.

Frames, Cast Steel Locomotive
General Steel Castings Corp.

Frames, Locomotive.
American Steel Foundries.
American Locomotive Co.
Baldwin Locomotive Works.
Birdsboro Steel Foundry & Machine Co.
Ohio Steel Foundry Co., The.
Union Steel Casting Co.

Frames, Truck.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works
Bettendorf Co., The.
Birdsboro Steel Foundry & Machine Co.
Buckeye Steel Castings Co.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
Ohio Steel Foundry Co., The.
Pressed Steel Car Co.
Pyle-National Co.
Symington Co., The.

Frames, Vanadium.
American Locomotive Co.
Baldwin Locomotive Works.
Birdsboro Steel Foundry & Machine Co.
Union Steel Casting Co.

Frogs and Crossings.
Bethlehem Steel Co.
Ramapo Ajax Corp.

Fulcrums, Brake Beam.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
National Malleable & Steel Castings Co.

Furnaces, Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Furnaces, Gasoline.
Railroad Supply Co.

Furnaces, Rivet Heating—(See Forges, Rivet Heating).

Furniture.
Aluminum Co. of America.

Gage Testers—(See Testers, Gage).

Gages, Air.
Westinghouse Air Brake Co.

Gages, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Gages, Steam.
Ashton Valve Co.

Gages, Tire.
Schrader's Son, Inc., A.

Gages, Wheel Press Recording.
Ashton Valve Co.

Gaskets.
Westinghouse Air Brake Co.

Gasoline.
Ethyl Gasoline Corp.

Gear Blanks, Rolled Steel.
Edgewater Steel Co.
Standard Steel Works Co.

Gears and Pinions.
American Steel Foundries.
Westinghouse Elec. & Mfg. Co.

Gears, Silent.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Gears, Valve — (See Valve Gears).

Generators, Acetylene.
Oxweld Railroad Service Co.

Generators, Car Lighting.
Safety Car Heating & Lighting Co.

Generators, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Sunbeam Electric Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Goggles, Welding.
Oxweld Railroad Service Co., The.
Sunbeam Electric Mfg. Co.

Graders, Elevating.
Western Wheeled Scraper Co.

Grapples, Wood.
Industrial Brownhoist Corp.

Grate Bars.
Q & C Co., The.

Grate Shakers, Automatic.
Franklin Railway Supply Co., Inc.

Grates.
Firebar Corp.

Grease Forming Machines.
Franklin Railway Supply Co., Inc.

Grey Iron.
American Brake Shoe & Foundry Co.

Grinders, Internal.
Micro Machine Co.

Grinders, Portable Crank Pin.
Micro Machine Co.

Grinding Machines.
Sellers & Co., Inc., Wm.

Grinding Machines, Portable.
Ingersoll-Rand Co.
Ryerson & Son, Inc., Joseph T.

Guard Rails, Treated.
Curtin-Howe Corp.
International Creosoting & Construction Co.

Guard Rails, Foot Guard.
Q & C Co., The.

Guard Rails (One Piece).
Bethlehem Steel Co.
Ramapo Ajax Corp.

Guard Switch Point.
Q & C Co., The.

Guards, Cattle.
American Bridge Co.

Guards, Dust.
Gould Coupler Co., The.
Symington Co., The.

Hair Felt.
Johns-Manville Corp.

Hammers, Pneumatic.
Ingersoll-Rand Co.

Hammers, Riveting.
Ingersoll-Rand Co.

Hammers, Steam.
Industrial Brownhoist Corp.
Sellers & Co., Inc., Wm.

Hand Brakes—(See Brakes, Hand).

Hangers, Ball Bearing.
S. K. F. Industries, Inc.

Hand Rails & Fittings.
Aluminum Co. of America.

Hangers, Bottom Rod Safety.
Chicago Railway Equipment Co.

Hangers, Car Door—(See Fixtures, Car Door).

Headgates, Sliding
Armco Culvert Manufacturers Association

Headlight Repair Parts, Electric.
Electric Service Supplies Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co.

Headlights, Electric.
General Electric Co.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co.
Westinghouse Electric & Mfg. Co.

Headlights, Reflectors & Cases.
Pyle-National Co.
Sunbeam Electric Mfg. Co.

Heaters, Electric.
Gold Car Heating & Lighting Co.
Westinghouse Electric & Mfg. Co.

Heaters, Feedwater.
Graver Tank & Mfg. Corp.

Heaters, Feedwater Locomotive.
Coffin Co., Jr., The J. S.
Superheater Company, The.
Worthington Pump & Machinery Corp.

Heaters, Feed Water, Stationary.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Heating & Ventilating Apparatus.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Westinghouse Electric & Mfg. Co.

Heating Equipment, Car.
Gold Car Heating & Lighting Co.
Safety Car Htg. & Ltg. Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Heating Systems, Car (Electric and Steam).
Gold Car Heating & Lighting Co.
Safety Car Htg. & Ltg. Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

High Temperature Cements.
Carey & Co., Philip, The.

Highway Crossing Protection Devices.
American Bridge Co.
Franklin Railway Supply Co., Inc.
Griswold Signal Co.
Railroad Supply Co.

Hoists, Chain.
Milwaukee Electric Crane & Hoist Corp.
Ryerson & So.., Jos. T.

Hoists, Electric.
Milwaukee Electric Crane & Hoist Corp.

Hoists, Pneumatic.
Ingersoll-Rand Co.

Hoisting Machinery.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Hooks, Wrecking.
National Malleable & Steel Castings Co.

Horns, Pneuphonic.
Westinghouse Air Brake Co.

Hose, Air, Steam, Etc.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Hose, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Hose, Tender.
Westinghouse Air Brake Co.

Incandescent Lamps.
General Electric Supply Corp.

Indicators, Speed & Cut-off.
Valve Pilot Co.

Ingots.
Birdsboro Steel Foundry & Machine Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
McConway & Torley Co.
Standard Steel Works Co.

Injectors, Exhaust Steam.
Sellers & Co., Inc., Wm.
Superheater Co., The.

Inspection of Material and Equipment—(See Engineers, Inspection).

Insulated Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Insulation, Car.
Carey Co., Philip, The.
Wood Conversion Co.

Insulation, Car, Bldg.
Carey Co., Philip, The.
JohnsManville Corp.
Lehon Co., The.
Tuco Products Corp.
Union Asbestos & Rubber Co.
Wood Conversion Co.

Insulation, Electrical.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Insulation, Exhaust & Heater Pipe.
Carey Co., Philip, The.
Johns-Manville Corp.
Tuco Products Corp.
Union Asbestos & Rubber Co.

Insulation, Heat.
Carey Co., Philip, The.
Miner, W. H.

Insulation Tape.
General Electric Supply Corp.

Insulators, Electrical, Porcelain.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Interlocking Plant Equipment.
General Railway Signal Co.
Union Switch & Signal Co.

Iron Chain.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Charcoal.
Bethlehem Steel Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Engine Bolt.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Forging Billets.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.

Iron, Hollow Staybolt.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Hollow Staybolt Bars.
Bethlehem Steel Co.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Pig.
Bethlehem Steel Co.

Iron, Refined.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Iron, Rivet.
Logan Iron & Steel Co.

Iron, Staybolt — (See also Staybolts).
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Logan Iron & Steel Co.
Reading Iron Co
Ryerson & Son, Joseph T.

Jacking, Locomotive.
Carey Co., Philip, The

Jacking Method of Installing Pipe
Armco Culvert Manufacturers Association

Jacks, Smoke.
Carey Co., Philip, The.
Johns Manville Corp.

Joints, Air Reservoir.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Blow Off Line (Roundhouse).
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Coach and Coach Yard.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Flexible.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co., Inc.

Joints, Flexible Ball.
Barco Mfg. Co.

Joints, Rail.
American Steel Foundries.
Carnegie Steel Co.
Illinois Steel Co.
Q & C Co., The.
Rail Joint Co.
Union Switch & Signal Co.

Joints, Steam, Air & Liquid.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co., Inc.

Joints, Swing.
Barco Mfg. Co.
Vapor Car Heating Co., Inc.

Journal Boxes and Lids.
Allegheny Steel Co.
American Steel Foundries.
Brill Co., The J. G.
Gould Coupler Co., The.
Hunt-Spiller Mfg. Corp.
National Malleable & Steel Castings Co.
Pullman Car & Mfg. Corp.
Railway Steel Spring Co.
Symington Co., The.
Union Spring & Mfg. Co.

Journal Oilers, Car & Locomotive.
Ardco Mfg. Co.

Keys, Brake Shoe.
Bradford Corporation.
Buffalo Brake Beam Co.
Mt. Vernon Car Mfg. Co.
Steel Car Forge Co.
Union Spring & Mfg. Co.

Knuckles, Emergency.
Q & C Co., The.

Laboratories, Testing.
Hunt Co., Robert W.
Pittsburgh Testing Laboratory.

Lacquers.
General Electric Supply Corp.
Sherwin-Williams Co.

Ladders, Steel Car.
Wine Railway Appliance Co.

Lagging, Locomotive.
Carey & Co., Philip, The.
Johns-Manville Corp.

Lamps, Incandescent.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lamps, Inspector's.
Oxweld Railroad Service Co., The.

Lath, Metal
Armco Railroad Sales Co.

Lathes, Axle.
Sellers & Co., Inc., Wm.

Lathes, Engine.
Ryerson & Son, Joseph T.

Lathes, Wheel.
Sellers & Co., Inc., Wm.

Lead, White.
National Lead Co.

Lighting Equipment, Car.
Electric Storage Battery Co.
Safety Car Htg. & Ltg. Co.

Lighting Fixtures and Systems.
General Electric Supply Corp.
Graybar Electric Co.
Pyle-National Co.
Safety Car Htg. & Ltg. Co.

Lighting Plants, Gas, Electric
Pyle-National Co., The.
Sunbeam Electric Mfg. Co.

Lightning Arresters.
General Electric Supply Corp.

Line Material.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lock Nuts—(See Nut Locks)

Locomotive Jacket Sheets.
Armco Railroad Sales Co.

Locomotive Water Conditioners
Bird-Archer Co., The.

Locomotives, Contractors.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Electric.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Locomotives, Gasoline.
Baldwin Locomotive Works.

Locomotives, Gas-Electric.
Brill Co., The J. G.
Electro-Motive Co.

Locomotives, Geared.
Lima Locomotive Works.

Locomotives, Industrial.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Mine.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Oil Engine, Electric Driven.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.
Whitcomb Locomotive Co., The.

Locomotives, Rebuilt.
American Locomotive Co.

Locomotives, Repair Parts.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Steam.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotive Stokers.
Standard Stoker Co.

Locomotive Valve Pilot.
Valve Pilot Co.

Lubricators, Driving Box.
Franklin Railway Supply Co., Inc.

Lubricators, Piston Rod.
Q & C Co., The.

Lumber, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.

Lumber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Industrial Lumber & Creosoting Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Machinery, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.

Machine Screws, Monel Metal
International Nickel Co., The.

Magnets, Lifting.
Industrial Brownhoist Corp.
Electro Metallurgical Sales Corp.

Mechanical Draft Apparatus—(See Heating and Vent. App.).

Mechanical Stokers.
Standard Stoker Co.

Melters, Snow, Electric.
Q & C Co., The.

Metallic Flexible Conduit.
General Electric Supply Corp.

Meters, Water & Oil.
Worthington Pump & Machinery Corp.

Milling Machines, Planer Type.
Sellers & Co., Inc., Wm.

Milling Machines, Plain and Universal.
Ryerson & Son, Joseph T.

Milling Machines, Portable Frame Jaw.
Micro Machine Co.

Mohair Upholstery Velvets.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Molybdenum Metal.
Vanadium Corp. of America.

Monel Metal, Rods, Sheets, Tubes, Wire, etc.
International Nickel Co., The.

Motors, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Motors & Generators.
Fairbanks-Morse & Co.

Moulding.
Aluminum Co. of America.

Multiple V Belt Drives.
Worthington Pump & Machinery Corp.

Nails.
American Steel & Wire Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Nipples, Air Hose.
Prime Manufacturing Co.

Nozzles, Exhaust.
Franklin Railway Supply Co., Inc.

Nozzles, Oxy-Acetylene Cutting.
Oxweld Railroad Service Co., The.

Nuts—(See Bolts and Nuts).

Nut Locks.
Dardelet Threadlock Corp.
Grip Nut Co.

Nuts, Tank Hose.
Prime Manufacturing Co., The.

Office Appliances.
Remington-Rand Business Service.

Oils, Diesel Engine
Vacuum Oil Co.

Oil, Dynamo
Vacuum Oil Co.

Oil-Electric Locomotives.
American Locomotive Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.

Oil Filtering & Storage Systems.
Graver Tank & Mfg. Corp

Oils & Greases Engine
Vacuum Oil Co.

Oils & Greases, Lubricating
Vacuum Oil Co.

Oils & Greases, Motor
Vacuum Oil Co.

Oil, Linseed.
National Lead Co.

Oils, Locomotive Valve
Vacuum Oil Co.

Oil Plugs, Steam Chest.
Franklin Railway Supply Co., Inc.

Oil, Turbine
Vacuum Oil Co.

Oxy-Acetylene Apparatus.
Oxweld Railroad Service Co., The.

Oxygen.
Oxweld Railroad Service Co., The.

Packing.
Westinghouse Air Brake Co.

Packing, Air Pump.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Westinghouse Air Brake Co.

Packing, Asbestos.

Packing, Cylinder and Valve Ring.
Johns-Manville Corp.
Hunt-Spiller Mfg. Corp.
Westinghouse Air Brake Co.

Packing, Locomotive Cab Cock.
Johns-Manville Corp.
Union Asbestos & Rubber Co.

Packing, Ring Boiler.
Union Asbestos & Rubber Co.

Packing, Semi-Metallic.
Pilot Packing Co.
Central Alloy Steel Corp.

Packing, Sheet.
Johns-Manville Corp.
Union Asbestos & Rubber Co.

Packing, Soft.
Carey & Co., Philip, The.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.

Packing, Throttle.
Johns-Manville Corp.
Union Asbestos & Rubber Co.

Paint Burners, Acetylene.
Oxweld Railroad Service Co., The.

Paint, Metal Protective.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.

Paint, Powder.
Aluminum Co. of America.

Paint Spraying Equipment.
De Vilbiss Mfg. Co., The.

Paints.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.

Paper, Carbon.
Remington-Rand Business Service.

Paper, Sheathing.
Carey & Co., Philip, The.

Patterns, for Iron, Steel & Brass Castings.
Baldwin Locomotive Works, The.

Pavement Breakers.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Pickling Equipment, Monel Metal.
International Nickel Co., The.

Pile Drivers.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Piling, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Piling, Sheet Steel.
American Bridge Co.
Carnegie Steel Co.
Inland Steel Company

Pilot Beams, Cast Steel.
General Steel Castings Corp.
Gould Coupler Co., The.

Pilots, Cast Steel.
General Steel Castings Corp.
Locomotive Finished Material Co.

Pins, Air Brake & Clevis.
Champion Rivet Co.

Pins, Center.
Miner, W. H.

Pins, Coupler Knuckle.
Champion Rivet Co.
McConway & Torley Co.
National Malleable & Steel Castings Co.

Pins, Crank.
American Locomotive Co.
Baldwin Locomotive Works.
Miner, Inc., W. H.
Standard Steel Works Co.
Union Asbestos & Rubber Corp.

Pipe, Corrugated Iron
Armco Culvert Manufacturers Association

Pipe, Paved Invert
Armco Culvert Manufacturers Association

Pipe Coverings.
Carey & Co., Philip, The.
Johns-Manville Corp.
Keasby & Mattison Co.

Pipe Fittings—(See Fittings, Pipe).

Pipe, Metal Culvert.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Republic Steel Corp.

Pipe, Perforated Iron
Armco Culvert Manufacturers Association

Pipe, Spiral Welded.
Armco Railroad Sales Co.

Pipe, Steel Signal.
National Tube Co.

Pipe, Spiral Welded.
Armco Railroad Sales Co.

Pipe, Wrought Iron.
Byers Co., A. M.
Reading Iron Co.

Planers, Plate.
Ryerson & Son, Jos. T.
Sellers & Co., Inc., Wm.

Plates.
Steel Car Forge Co.

Plates, Follower.
Steel Car Forge Co.

Plates, Boiler, Firebox—(See Steel Firebox).

Plates, Center—(See Bearings, Center).

Plates, Iron & Steel.
Armco Railroad Sales Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Plate & Sheet Metal Work.
Baldwin Locomotive Works, The.

Plates, Tie.
Illinois Steel Co.
Inland Steel Company.
Railroad Supply Co.
Tennessee Coal, Iron & Railroad Co.

Plates, Tin and Terne.
American Sheet & Tin Plate Co.

Platforms, Car.
Gould Coupler Co., The.
Standard Coupler Co.

Platforms, Cast Steel, Passenger Car.
General Steel Castings Corp.

Plows, Railroad and Grading.
Western Wheeled Scraper Co.

Plows, Snow.
American Locomotive Co.
Brill Co., The J. G.
Q & C Co., The.

Plush, Mohair.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Pneumatic Tools.
Ingersoll-Rand Co.

Poles, Signal.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
General Railway Signal Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Union Switch & Signal Co.

Poles, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
General Electric Supply Corp.
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Poles, Steel Tubular.
Graybar Electric Co.
National Tube Co.

Posts, Fence, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Inland Steel Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Posts, Steel Fence.
American Steel & Wire Co.
Q & C Co., The.

Powder, Blasting—(See Explosives).

Powdered Coal Equipment.
Muhlfeld, John E.

Power Plants.
General Electric Co.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.

Power Transmission Supplies.
Sellers & Co., Inc., Wm.

Preservatives, Wood.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Presses, Flanging Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Presses, Hydraulic.
Baldwin-Southwark Corp.
Birdsboro Steel Foundry & Machine Co.

Presses, Wheel.
Birdsboro Steel Foundry & Machine Co.
Sellers & Co., Inc., Wm.

Pulverizers, Coal — (See Crushers, Coal).

Pumping Stations.
Fairbanks-Morse & Co.

Pump Liners, Monel Metal.
International Nickel Co., The.

Pump Rods, Monel Metal.
International Nickel Co., The.

Pump Shafts, Monel Metal.
International Nickel Co., The.

Pumps, Hydraulic.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Pumps & Pumping Mchy.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Pumps, Vacuum.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Punching and Shearing Machines.
Ryerson & Son, Joseph T.

Pushers, Coal.
Standard Stoker Co.

Pyrometers, Superheated Steam.
Superheater Co., The.

Rail Anchors.
Bethlehem Steel Co.
P. & M. Co., The.

Rail-Bonds.
American Steel & Wire Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Rail Braces — (See Braces, Rail).

Rail Reclamation Equipment.
Ryerson & Son, Joseph T.

Railroad Shops.
United Engineers & Constructors, Inc.

Rail Splice Plates — (See Joints, Rail).

Railroad Structures — (See Engineers and Contractors; also Building).

Rails.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.
Tennessee Coal, Iron & Railroad Co.
Thomson Rail Corp.

Railway Signals.
General Electric Supply Corp.

Rattan.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Receivers, Air.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.

Recorders, Speed & Cut-off.
Valve Pilot Co.

Rectifiers for Signal Work.
General Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.

Reducing Valves.
Vapor Car Heating Co., Inc.

Reflectors, Headlight.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co.

Refrigerators.
Wine Railway Appliance Co.

Regulators, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Relays.
General Railway Signal Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Logan Iron & Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co.

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts' & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co.

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Baldwin Locomotive Works, The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Logan Iron & Steel Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety).

Stokers, Locomotive.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Okonite Co., The.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

Testers, Rail.
Sperry Products, Inc.

Testers, Staybolt.
Flannery Bolt Co.

Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.

Tie Plates.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Company
Railroad Supply Co.

Ties, Creosoted.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Ties, Steel.
American Bridge Co.
Bethlehem Steel Co.
Carnegie Steel Co.

Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Tile, Cement, Concrete.
Federal American Cement Tile Co.

Timber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber Co.
Southern Wood Preserving Co.
Wood Conversion Co.

Tires.
Firestone Tire & Rubber Co.
General Tire & Rubber Co.
Goodyear Tire & Rubber Co.
Goodrich Rubber Co., B. F.

Tires, Steel.
Edgewater Steel Co.
Midvale Co., The.
Railway Steel Spring Co.
Standard Steel Works Co.

Toilet Papers
U. S. Envelope Co.

Tools, High Speed Steel.
Bethlehem Steel Co.
Bird-Archer Co., The.

Towers, Floodlight.
Pyle-National Co.

Track Skates.
Q & C Co., The.

Tractors.
Caterpillar Tractor Co.
Elwell-Parker Electric Co.
Industrial Lumber Co.
International Creosoting & Construction Co.

Tractors, Industrial.
Elwell-Parker Electric Co.
International Harvester Co.

Tractors, Turntable.
Nichols & Bro., Geo. P.

Train Control Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Tramways, Wire Rope.
American Steel & Wire Co.

Transfer Tables.
American Bridge Co.
Industrial Brownhoist Corp.
Nichols & Bro., Geo. P.

Transformers.
General Electric Supply Corp.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Trap Doors.
Edwards Co., O. M.

Trap Doors & Fixtures.
Tuco Products Corp.

Traps, Steam.
Johns-Manville Corp.

Treads, Bridge Floor.
Carnegie Steel Co.

Treads, Safety.
Ryerson & Son, Joseph T.

Treatment Water—(See Water Softening and Purifying).

Truck Frames—(See Frames, Truck).

Trucks, Oxy-Acetylene Supply.
Oxweld Railroad Service Co., The.

Trucks, Car and Locomotive.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works.
Bettendorf Company, The.
Birdsboro Steel Foundry & Machine Co.
Brill Co., The J. G.
Flexible Truck Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Standard Car Truck Co.
Symington Co., The.

Trucks, Cast Steel Tender.
General Steel Castings Corp.

Trucks, Cast Steel, Electric Car.
General Steel Castings Corp.

Trucks, Cast Steel, Car and Locomotive.
General Steel Castings Corp.

Trucks, Electric Storage Battery.
Elwell-Parker Electric Co.

Trucks, Industrial.
Elwell-Parker Electric Co.

Trucks, Motor.
Dodge Motor Truck Corp.
General Motors Truck Co.
International Harvester Co.
Reo Motor Car Co.
White Co., The.

Trucks, Tender.
Flexible Truck Co.

Trucks, Trailer.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.

Tubes, Arch.
National Tube Co.

Tubes, Boiler.
Allegheny Steel Co.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Globe Steel Tubes Co.
National Tube Co.
Ryerson & Son, Joseph T.

Tubes, Boiler, Charcoal Iron.
Bethlehem Steel Co.
Reading Iron Co.

Tubes, Staybolt.
Falls Hollow Staybolt Co.

Tubes, Tire.
Firestone Tire & Rubber Co.
Goodyear Tire & Rubber Co.

Tubing.
Aluminum Co. of America.

Tubing, Seamless Steel.
National Tube Co.

Tungsten Metal.
Vanadium Corp. of America.

Turbo Generators.
Electric Service Supplies Co.
General Electric Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Turnbuckles.
American Bridge Co.
American Steel & Wire Co.
Ryerson & Son, Joseph T.

Turntable Tractors.
Nichols & Bro., Geo. P.

Turntables.
American Bridge Co.
Industrial Brownhoist Corp.
Nichols & Bro., Geo. P.

Typewriter Ribbons.
Remington-Rand Business Service.

Typewriters.
Remington-Rand Business Service.

Uncoupling Device.
Hutchins Car Rfg. Co.

Undercrossings, Corrugated Iron.
Republic Steel Corp.

Underfloor Duct.
General Electric Supply Corp.

Underfloor Duct, Fibre and Metal.
Johns-Manville Corp.

Underframes, Cast Steel, Tender.
General Steel Castings Corp.

Underframes, Cast Steel, Freight Car.
General Steel Castings Corp.

Underframes, Steel.
Bettendorf Co., The.
Brill Co., The J. G.
Pressed Steel Car Co.
St. Louis Car Co.

Underground Conduit.
General Electric Supply Corp.

Upholstery, Car.
Brill Co., The J. G.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Valve Caps.
Schrader's Son, Inc., A.

Valve Gears, Locomotive.
Pyle-National Co.

Valves, Air Brake.
Westinghouse Air Brake Co.

Valves, Back Pressure Acetylene.
Oxweld Railroad Service Co., The.

Valves, Blow-Off.
Bird-Archer Co., The.

Valves, Check & Angle Steam
Sellers & Co., Inc., Wm.

Valves, Drifting.
Ardco Mfg. Co.
Sellers & Co., Inc., Wm.

Valves, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Valves, Piston.
Franklin Railway Supply Co., Inc.

Valves, Pop, Safety & Relief.
Ashton Valve Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Valves, Pressure Regulating.
Gold Car Heating & Lighting Co.

Valves, Throttle.
American Throttle Co., Inc.
Bradford Corporation.

Valves, Fire.
Schrader's Son, Inc., A.

Varnish Powder.
Aluminum Co. of America.

Varnishes.
General Electric Supply Corp.
Lowe Bros. Co., The
Sherwin-Williams Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Ventilators, Car.
Gold Car Heating & Lighting Co.

Ventilators, Shop & Roundhouse.
Carey Co., Philip, The.
Johns-Manville Corp.

Wardrobes, Rolling and Disappearing Front — (See Lockers).

Washers.
National Malleable & Steel Castings Co.
Ryerson & Son, Joseph T.
Wine Railway Appliance Co.

Washers, Boiler.
Sellers & Co., Inc., Wm.

Waterproofing Materials and Compounds.
Carey Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Water Purifying Materials & Compounds.
Bird-Archer Co., The.
Dearborn Chemical Co.

Water Softening & Purifying.
Bird-Archer Co., The.
Dearborn Chemical Co.
Graver Tank & Mfg. Corp.
Permutit Co., The.

Weather Stripping.
Tuco Products Corp.

Wedges, Automatic.
Franklin Railway Supply Co., Inc.

Wedges, Journal Box.
American Steel Foundries.
Gould Coupler Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Symington Co., The.

Weed Killer.
Q & C Co., The.

Welding Machines, Acetylene.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T.
Westinghouse Elec. & Mfg. Co.

Welding Machines, Electric.
General Electric Co.
Ryerson & Son, Joseph T.

Welding Machines, Flue.
Ryerson & Son, Joseph T.

Welding Materials.
Oxweld Railroad Service Co.
Franklin Railway Supply Co., Inc.

Welding Process.
Oxweld Railroad Service Co.

Welding Rods.
American Steel & Wire Co.
General Electric Supply Corp.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T.

Welding Supplies.
General Electric Co.
Oxweld Railroad Service Co., The.

Welding and Cutting Apparatus—(See Cutting and Welding Apparatus).

Well Casings, Corrugated Iron.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

Wheel Centers, Driving.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Birdsboro Steel Foundry & Machine Co.
Edgewater Steel Co.
Hunt-Spiller Mfg. Corp.
Standard Steel Works Co.
Union Steel Casting Co.

Wheels, Car and Locomotive.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Cast Iron, Chilled Tread.
Assn. of Mfrs. of Chilled Car Wheels.
Graybar Electric Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Wheels, Mine Car.
Carnegie Steel Co.
Edgewater Steel Co.
Mt. Vernon Car Mfg. Co.
Standard Steel Works Co.

Wheels, Passenger Car.
Carnegie Steel Co.
Illinois Steel Co.
Edgewater Steel Co.
Pullman Car & Mfg. Corp.
Standard Steel Works Co.

Wheels, Steel and Steel Tired.
American Locomotive Co.
American Steel Foundries.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Lima Locomotive Works.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Wrought Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Standard Steel Works Co.

Whistles.
Ashton Valve Co.

Whistles, Locomotive.
General Electric Co.
Westinghouse Air Brake Co.

Window Fixtures.
Edwards Co., O. M.
Tuco Products Corp.

Wire.
American Steel & Wire Co.
Kerite Insulated Wire & Cable Co.
Okonite Co., The.

Wire, Fence.
American Steel & Wire Co.

Wire, Insulated.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Co.
Graybar Electric Co.
Kerite Insulated Wire & Cable Co.
Okonite Co., The.

Wire, Rail Bond.
American Steel & Wire Co.
Graybar Electric Co.

Wire Rope Clips.
American Steel & Wire Co.

Wire Rope.
American Steel & Wire Co.

Wire, Telephone & Telegraph
American Steel & Wire Co.
Anaconda Wire & Cable Co.
Graybar Electric Co.

Wire, Welding.
American Steel & Wire Co.
Oxweld Railroad Service Co., The.

Wiring Appliances.
Pyle-National Co.

Wood, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Wood Preservative — (See Preservative, Wood).

Wood, Preservative Treatment (Zinc Meter Arsenic).
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Wrecking Cranes — (See Cranes, Wrecking).

Z M A Wood Preservative (Zinc Metal Arsenite).
Curtin-Howe Corp.

Index To Advertisers

A

Allegheny Steel Co. 39
American Arch Co., Inc., The 25
American Bridge Co. 37
American Locomotive Co... 26
American Steel Foundries.. 11
Armco Railroad Sales Co. 13
Ashton Valve Co. 39
Associated Business Papers, Inc. 8

B

Baldwin Locomotive Works, The 4
Battey & Kipp, Inc. 40
Bethlehem Steel Company.. 33
Bird-Archer Co., The 37
Bixby, Inc., R. W. 40
Buffalo Brake Beam Co... 39
Burroughs Adding Machine Co. 10
Buyers' Index ...41 to 42 incl.

C

Camel Co. 38
Cardwell-Westinghouse Co.. 14
Chicago Railway Equipment Co. 12
Century Wood Preserving Co. (Division of the Wood Preserving Corp.)..... 9
Classified Advertisements .. 40

D

De Vilbiss Co., The 36

E

Edgewater Steel Co. 16

F

Falls Hollow Staybolt Co... 39
Firebar Corporation 29
Franklin Railway Supply Co., Inc. 24

G

General American Tank Car Corp. 15
General Electric Co. 2
Get Together Department.. 40
Gulick-Henderson Co. ... 40

H

Harbison-Walker Refractories Co. 25
Hunt Co., Robert W. 40
Hunt-Spiller Mfg. Corp. .. 30
Hutchins Car Roofing Co. 22
Hyman-Michaels Co. 40

I

Illinois Steel Co. 27

K

Kerite Insulated Wire & Cable Co., The 36

L

Lima Locomotive Works, Inc. 23
Logan Iron & Steel Co. .. 39

M

Magnus Co. 36
Miner, W. H. Inc.. 3
Mt. Vernon Car Mfg. Co...38
Muhlfeld, John E. 40

N

National Lead Co. 7
Nichols & Bro., Geo. P., The 39

O

Ohio Locomotive Crane Co., The 37
Okonite-Callender Cable Co., Inc., The 37
Okonite Co., The 37

P

P. & M. Co., The 39
Pittsburgh Testing Laboratory 40
Professional Directory 40

R

Railroad Supply Co., The.. 39
Railway Educational Bureau, The 40
Railway Steel Spring Co... 50
Republic Steel Corporation. 28
Ryerson & Son, Inc., Jos. T. 39

S

Safety Car Heating & Lighting Co., The 38
Simmons-Boardman Publishing Co. 49
S K F Industries, Inc. 17
Standard Car Truck Co. .. 37
Standard Steel Works Co... 19
Standard Stoker Co., Inc., The 34
Stucki Co., A 39
Sunbeam Electric Mfg. Co. 38
Superheater Co., The 31
Symington Co., The, Front Cover

T

Timken Roller Bearing Co., The 20, 21
Tuco Products Corp. 39

U

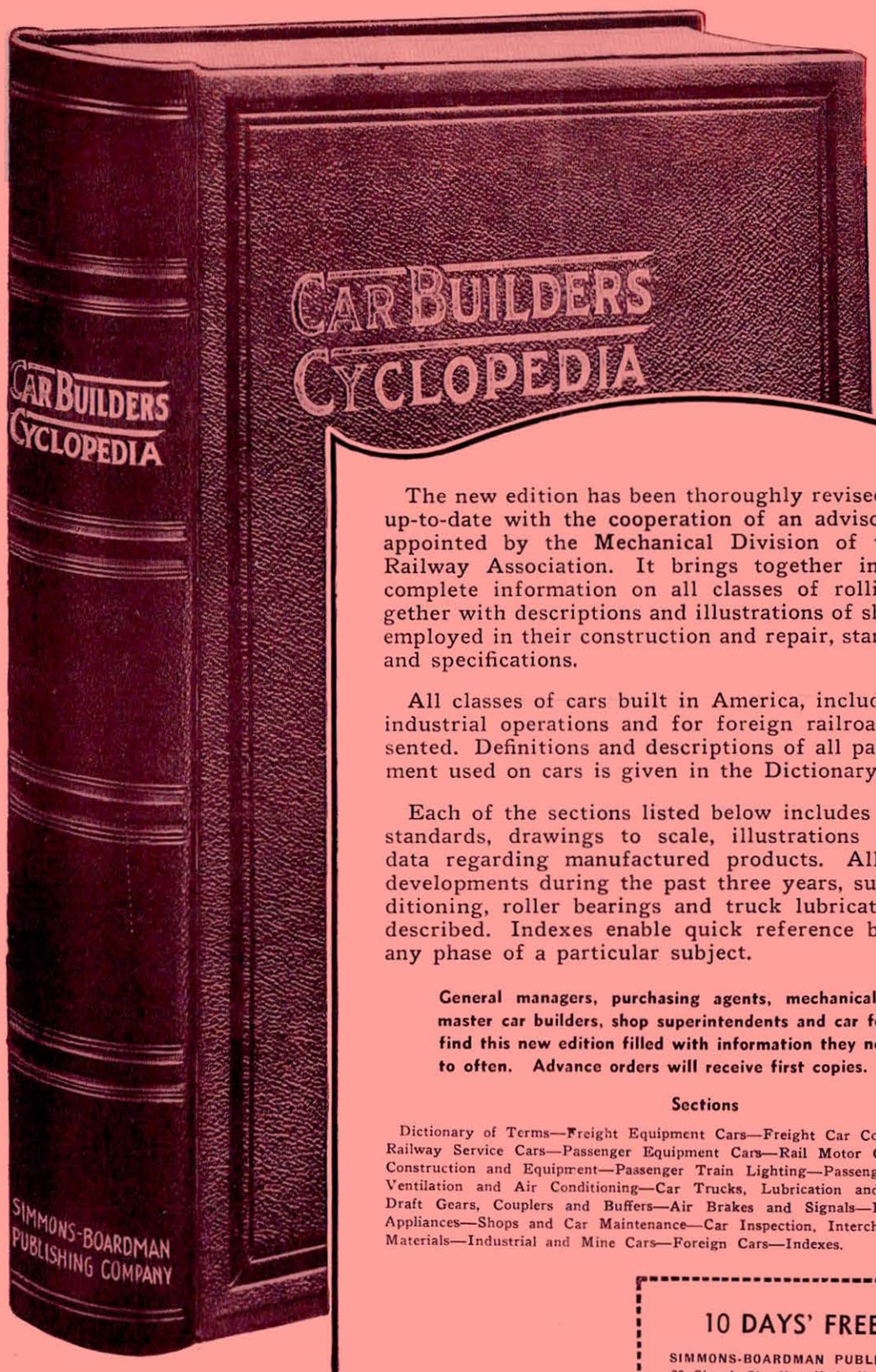
Union Asbestos & Rubber Co. 39
Union Metal Products Co. 18
Union Spring & Mfg. Co. 39
Union Steel Casting Co. .. 39

V

Vacuum Oil Company 6
Vanadium Corporation of America 35

W

Western Wheeled Scraper Co. 39
Westinghouse Air Brake Co. 32
Wine Railway Appliance Co., The 38



NOW Ready

Thirteenth Edition

The new edition has been thoroughly revised and brought up-to-date with the cooperation of an advisory committee appointed by the Mechanical Division of the American Railway Association. It brings together in one volume complete information on all classes of rolling stock, together with descriptions and illustrations of shops and tools employed in their construction and repair, standard practice and specifications.

All classes of cars built in America, including those for industrial operations and for foreign railroads, are represented. Definitions and descriptions of all parts and equipment used on cars is given in the Dictionary of Terms.

Each of the sections listed below includes specifications, standards, drawings to scale, illustrations and technical data regarding manufactured products. All of the new developments during the past three years, such as air conditioning, roller bearings and truck lubrication, are fully described. Indexes enable quick reference being made to any phase of a particular subject.

General managers, purchasing agents, mechanical engineers, master car builders, shop superintendents and car foremen will find this new edition filled with information they need to refer to often. Advance orders will receive first copies.

Sections

Dictionary of Terms—Freight Equipment Cars—Freight Car Construction Details—Railway Service Cars—Passenger Equipment Cars—Rail Motor Cars—Passenger Car Construction and Equipment—Passenger Train Lighting—Passenger Train Heating—Ventilation and Air Conditioning—Car Trucks, Lubrication and Roller Bearings—Draft Gears, Couplers and Buffers—Air Brakes and Signals—Brake Gears—Safety Appliances—Shops and Car Maintenance—Car Inspection, Interchange, Loading—Car Materials—Industrial and Mine Cars—Foreign Cars—Indexes.

1260 pages, 3,400 illustrations, 9 x 12 inches

Buckram binding $5.00; Leather binding $7.00

10 DAYS' FREE EXAMINATION

SIMMONS-BOARDMAN PUBLISHING COMPANY
30 Church St., New York, N. Y.

Send me postpaid in the binding I have checked a copy of the new 1931 edition of the Car Builders' Cyclopedia. It is understood that I can return the book within ten days if I am not absolutely satisfied. If I decide to keep the book I will remit the list price at that time.

( ) Buckram $5.00 ( ) Leather $7.00

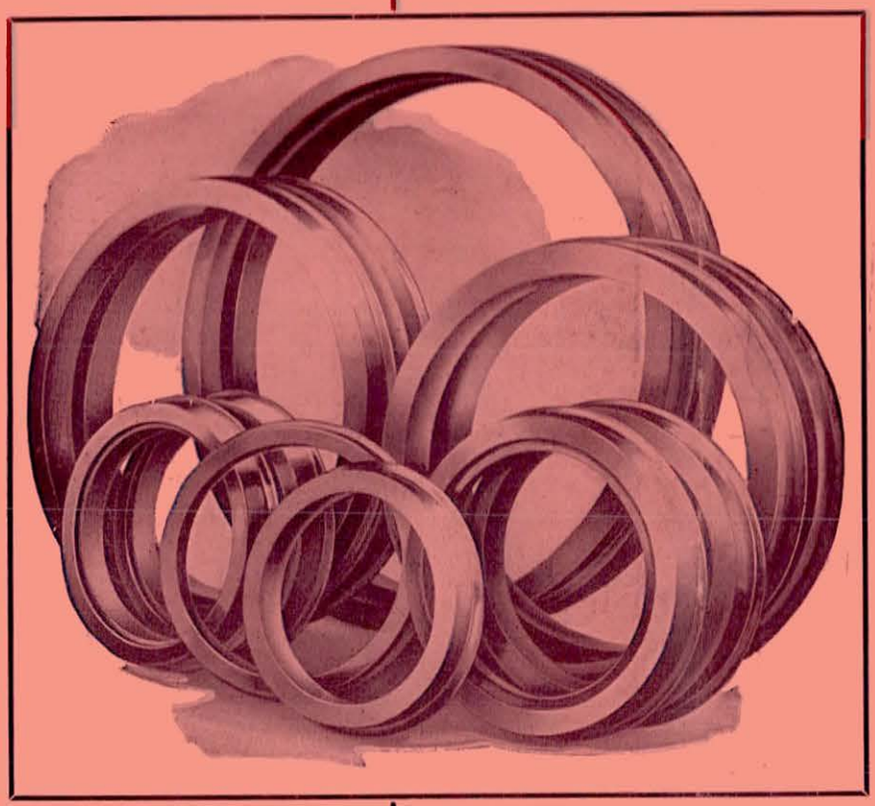
Name .....

Address .....

City ..... State .....

Position ..... Company .....

(This offer is limited to the United States and Canada) R.A. 8-8-31



Tires Wheels Springs

For Every Type of Rolling Stock In Every Class of Service

"RAILWAY" locomotive and car wheel tires are made to meet the particular requirement of service. It may be the long continued run of the passenger train or the many stops and starts of the switcher with its constant crowding through switches. For every type of use a tire must be employed that will give the maximum life if there is to be the greatest economy.

Only experience and laboratory research can provide that knowledge. You find it in all "Railway" products.

"RAILWAY"

Railway Steel-Spring Company

30 CHURCH ST., NEW YORK

Branch Offices:

Chicago, Ill. Detroit, Mich. St. Louis, Mo. Pittsburgh, Pa. Montreal, Que.
St. Paul, Minn. Washington, D. C. Cleveland, Ohio Denver, Colo. San Francisco, Cal.